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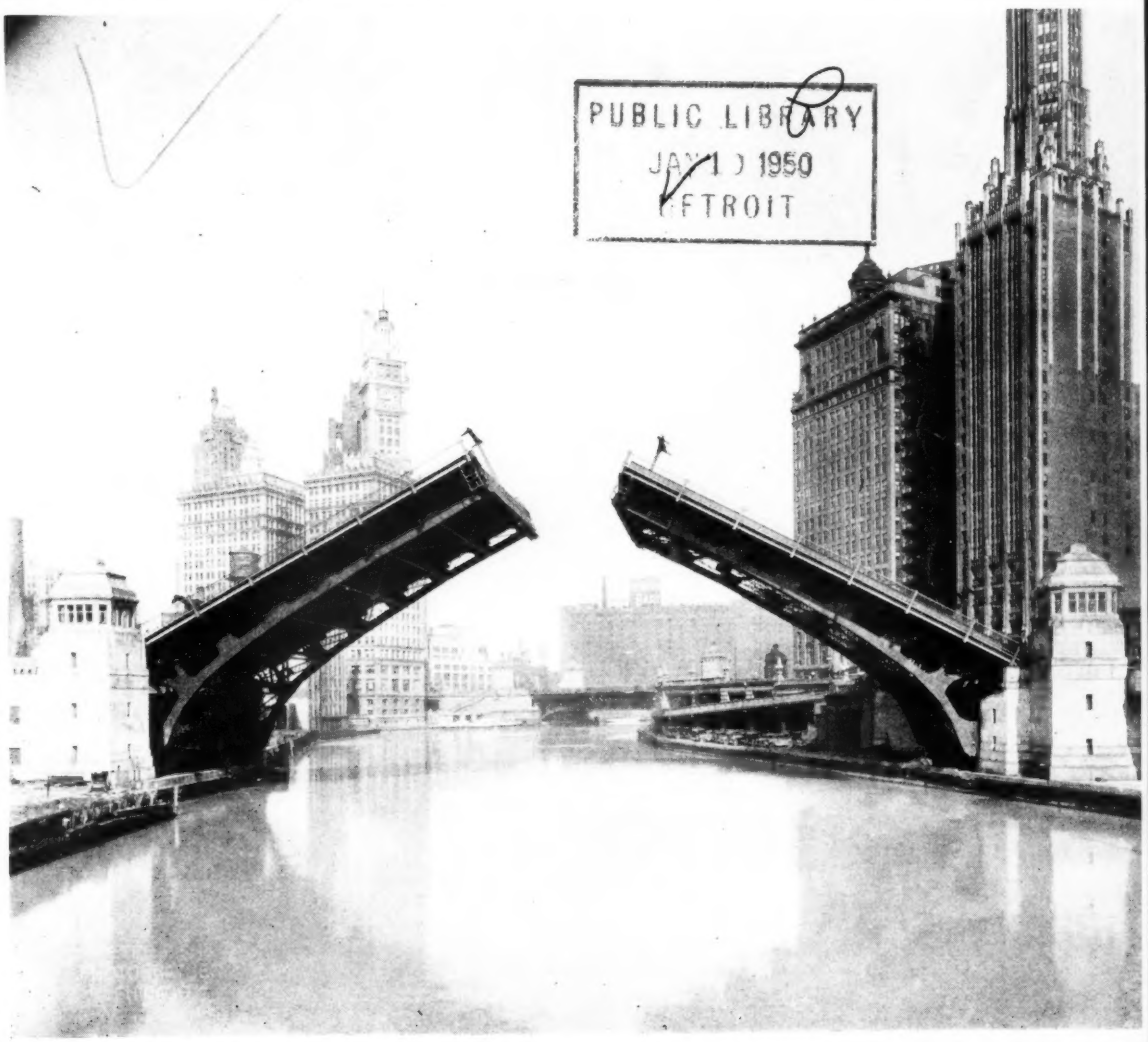

THE STORY OF CHICAGO'S BRIDGES

WSE MEETINGS—PAGE TWO

Vol. 2 JANUARY, 1950 IN TWO PARTS—PART ONE No. 5

GENERAL AND EDITORIAL OFFICES
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MIDWEST ENGINEER

A Publication of the

WESTERN SOCIETY OF ENGINEERS

Serving the Engineering Profession

January, 1950 Vol. 2, No. 5

CONTENTS

COVER CREDIT

The Wabash Avenue Bridge over the main branch of the Chicago River, shown on our front cover, was awarded the First Prize of the American Institute of Steel Construction in 1930, for the most beautiful bridge costing over $1,000,000 built in that year.

Western Society Activities This Month

Fellowship—5 to 6 p.m.; Dinner—6 to 7 p.m. (Reservations Please); Meeting—7 p.m.

Fielding

Richie

Dore

January 23, Air Safety

SPONSORED BY THE ELECTRICAL AND COMMUNICATIONS ENGINEERING SECTIONS

"Safety in the Federal Airways through Electronics," will be discussed by a panel of three speakers from the Civil Aeronautics Administration, Monday, January 23.

Panel members will include S. M. Richie, Deputy Chief of the Chicago CAA Regional Headquarters Facilities Division; John R. Fielding, Senior Air Route Traffic Controller of the Chicago Air Traffic Control Center and Arthur J. Dore, Electrical Engineer in the Facilities Division.

J. R. Fielding began his CAA career in 1941, was a Naval Aviator in the Pacific Theater during the war, and returned to the CAA to work as controller in the Chicago center. Since that time, he has advanced to the highly responsible supervisory position of Senior Air Route Traffic Controller.

In addition to his CAA work, he has completed his college education since the war, receiving the BA degree from De Paul University in 1946. He will receive the degree of Doctor of Jurisprudence from Loyola University in February, 1950, and has already been admitted to the Illinois Bar.

S. M. Richie, has been responsible since 1940 for engineering and installation work in connection with the establishment, modernization or relocation of radio aids to air navigation and associated communication facilities within CAA's Region Three. He received the degree of B.S. in E.E. from Texas A & M in 1929, and has done graduate work at the University of Michigan, Illinois Institute of Technology and Northwestern University.

A. J. Dore was employed by the Teletype Corporation from 1936 to 1942 as a Research and Development Engineer, then spent four years in World War II as an Army Ordnance Technical Officer. He joined the CAA in 1946 as Chief of Land Lines Installation Section in charge of all installation work on CAA's extensive telegraph network in eight mid-western states. His duties now include responsibility for installation engineering of airport field cables, high intensity lighting, and electronic engineering of airways flight inspection aircraft.

January 25, Reserve Meeting

WSE sends last call to former officers and enlisted men who wish to join in a RESERVE CORPS ENGINEER CONSTRUCTION BRIGADE HEADQUARTERS to consist of 39 officers and 166 enlisted men. See Page 13.

January 30, CTA Purposes

SPONSORED BY THE TRANSPORTATION ENGINEERING SECTION

Ralph Budd, Chairman of Chicago Transit Board and long recognized as one of the nation's outstanding railroad executives, will be the Society's guest speaker at its meeting Monday, January 30th. Mr. Budd will discuss generally the purposes and functions of the Chicago Transist Authority.

Mr. Budd's career, begun in 1899 in the engineering department of the Chicago Great Western railroad, is a typical American success story. By 1919, after holding positions of importance on railroad in various sections of the country, Mr. Budd had risen to the office of President of the Great Northern Railroad. In 1932, he became President of the Chicago Burlington and Quincy Railroad and remained in that capacity until his retirement on September 1, 1949.

Mr. Budd has served his country on several occasions when his talents were needed . . . in 1906, as chief engineer of the Panama Railroad, a key task in the building of the Panama Canal; in 1930, on a comprehensive survey of Russian railroads; in 1940, as a member of the Advisory Commission to the Council of National Defense in Charge of Transportation; and again in 1943, as a Colonel, Transportation Corps, U. S. Army, during the period of War Department operations of the nation's railroads.

Today his experience and energies are spearheading the efforts of the Chicago Transit Board to bring to Chicago the efficient, modern, unified local transit system envisioned in the State law creating the Chicago Transit Authority.

February 6, Prestressed Concrete

SPONSORED BY BRIDGE AND STRUCTURAL SECTION AND AMERICAN SOCIETY OF CIVIL ENGINEERS

Blair Birdsall, Assistant Chief Engineer, Bridge Division, John A. Roebling's Sons Company, will speak on "Americanized Prestressed Concrete."

He will discuss his company's studies of the problems of prestressed concrete, particularly as they relate to wire and wire products. Their aim has been to find the proper type of wire, strand and cable to use in prestressed concrete, and also to find the method of application of these materials to be consistent with American construction practices.

Mr. Birdsall is a graduate of Princeton University with the B.S. and C.E. degrees. He joined the Roebling firm in 1934, assisting in engineering designs in connection with bridge contracts, including the Golden Gate bridge, on which he was Field Engineer. He rose to his present position in 1940.

The Story of Chicago's Bridges

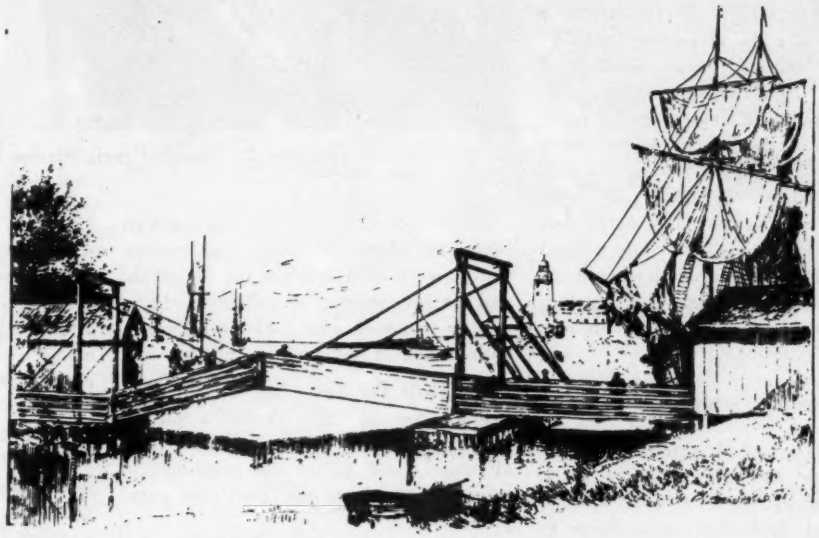


Figure 1. Dearborn Street Bridge, 1834.

Donald N. Becker (WSE)
Structural Engineer
A. J. Boynton & Co.

When one enters the Chicago River on a steamer from Lake Michigan, the first thing that impresses him is the magnificent Outer Drive bridge with its massive bascule leaves, which raise as it by magic to permit the passage of the vessel. As one proceeds along the river, bridge after bridge of this same general type opens its gargantuan jaws as if to swallow the boat. This is done with so little inconvenience to either the river or street traffic that one cannot help but wonder if it was ever thus.

The story of Chicago's bridges starts with the first settlements of the City. As early as 1829 a toll ferry was placed in operation near the present Lake Street bridge over the south branch of the river. Such transient service, with accompanying delays, was not to the liking of Chicagoans of that day any more than today's delays, whether at bridges, stop-lights, or the like, are to the liking to today's Chicagoans. Accordingly, in 1833 a crude floating bridge consisting of rough-hewn logs, was thrown across the river a little south of the ferry with the help of the U. S. troops quartered at Fort Dearborn at a cost of $486.20, of which the citizens contributed $286.20 and the Pottawattomie Indians $200. This bridge could be opened so that the river traffic, mainly canoes, could pass through. Due to its crude construction, this bridge could be maintained only with frequent repairs until it was removed in 1840.

In 1834 the first drawbridge was built across the river at Dearborn Street. It was similar to the drawbridge of medieval days, with two hinged leaves that, when raised, provided a 60-ft. draw for the boats. (See Fig. 1) Frequently it refused to operate, thus interfering with both river and street traffic, so it was removed in 1839.

(*Continued on Page* 4)

The Story of Chicago's Bridges

(*Continued from Page* 3)

Pressure for a bridge became so strong again in 1840 that a bridge was built at Clark Street. It was a sort of pontoon arrangement with a float which could be pulled around by means of a chain and windlass to provide a draw for vessels. A roadway was constructed on top of this float so that vehicles could drive across. The following year a similar bridge was built at Wells Street, to be replaced in 1847, at a cost of $3,200, by a more elaborate one consisting of boiler iron drums with a wooden deck to form a floating draw 100 ft. long, providing a clear passageway for navigation of 81 ft., two roadways for teams and a sidewalk on either side. By 1849 several more had been constructed, but all of them were swept away by a flood on March 12, 1849, necessitating a reversion to ferries until new bridges could be completed during the summer.

Develop Swing Bridge

A new type, called a pivot or swing bridge, made its appearance in 1854, again at Clark Street. It cost $12,000 and was not dependent upon floats to carry the traffic, but consisted of wooden trusses, supported upon a pile center pier, that could be rotated about a pivot to permit vessels to pass through the draw. It provided a double carriageway and two sidewalks.

Begin City Financing

Up to 1856 all bridges had been constructed at the expense of benefited citizens but in this year it was proposed to built a bridge at Madison Street at municipal expense. In spite of vigorous protest the bridge was financed, and completed the following year. It was of iron, 155 ft. long and was the first Chicago bridge with masonry foundations. By this time, the development of bridge foundations had progressed so that all the city's bridges, then numbering six, withstood a heavy flood in February, 1857.

Figure 2. North Clark Street Bridge, 1865.

An improved design was instituted in 1865, in which the upper and lower chords were of iron while the diagonals and verticals were of wood that could be readily renewed with little interference with travel on the bridge. (See Fig. 2)

By 1870 the City had 27 movable bridges, costing well over half a million dollars. Of these, one was all iron, nine all wood, and 17 of the combination type described in the previous paragraph.

By this time the river traffic had developed to so great an extent that there was almost open warfare between river and street traffic, each claiming the right to preference. In 1853 serious consideration was given to providing tunnels under the river which finally culminated in the completion of the Washington Street tunnel in 1869 and the LaSalle Street tunnel in 1871. When Chicago's great fire of October 9, 1871, destroyed 8 bridges, the LaSalle Street tunnel provided the only outlet to the north until the bridges were rebuilt.

Later Bridges Differ

The bridges built during the period following the fire were a far cry from the wooden truss swing bridges of the 50's. They are best exemplified by the Rush Street bridge built in 1884 (see Fig. 3), which was of wrought iron, 240 ft. long by 50 ft. wide, providing two 18-ft. roadways and two sidewalks, 8 ft. wide in the clear. It had three trusses resting on a turntable carried on 74 cone-shaped rollers. The bridge was operated by steam-driven machinery and could open for river traffic in about one minute, whereas the early bridges of the 50's were hand-operated and took more than five minutes to open or close. This bridge served until 1920, when it was superseded by the Michigan Avenue bridge.

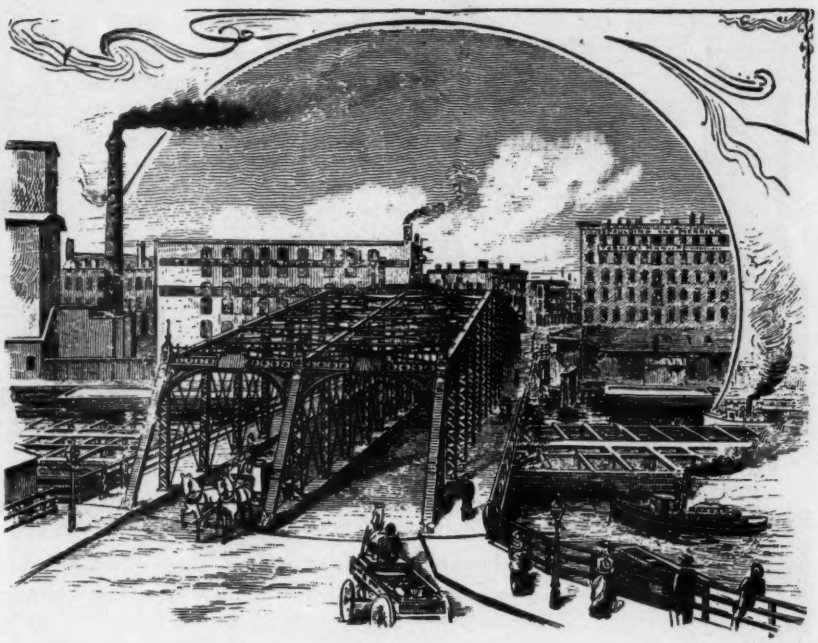
Bridges Total 48 In 1890

By 1890 the number of bridges had risen to 48 and the annual maintenance charges were $100,000.

As early as 1873 suggestions were made that closed periods for the bridges should be established, some advocating closing the bridges to river traffic all day, others for two-hour periods at morning, noon and evening rush periods. Those of more discerning mind appreciated that any undue advantage to either river or street traffic would be a serious blow to the development of the City, as its very existence was due primarily to the presence of the river, and the bridges were an absolute necessity for the transaction of business. However, in 1881, a bridge-closing ordinance was put in effect which kept the bridges closed for only one hour in the morning and again in the evening rush period.

In 1883 studies were made for the construction of a harbor along the lake front between the river mouth and 39th Street with channels from the lake to the river at 39th Street and at Fullerton Avenue so that masted traffic could avoid the center of the City and thus permit fixed bridges. This was, beyond a doubt, the most drastic move yet made to solve the problem and if it had been put into effect might have changed the entire history of Chicago, whether for better or worse no one can tell.

With each renewal of a bridge, the increasing street traffic demanded increasing facilities in the way of wider roadways. It was found that providing two lanes for traffic in each direction with a sidewalk on each side required a bridge over 50 ft. wide, and a center pier at least 50 ft. in diameter, which, when located near mid-stream, left only narrow channels on either side that were difficult to navigate, especially where the river turned or where boats were tied up at adjacent docks. Boats were also increasing in width, length and draft with the result that great pressure was brought to eliminate such obstructions to navigation.



RUSH-STREET BRIDGE.

Figure 3. Rush Street Bridge, 1884.

Jack-Knife Bridge

In 1890 a new type of bridge was built at Weed Street which provided a clear draw in mid-channel and another at Canal St. in 1892. (See Fig. 4) It was a so-called jack-knife bridge, patented by Capt. Harmon, which had an action resembling that of a loosely-hinged jack-knife. As each half of the bridge raised about hinges at each side of the channel the front half of each leaf folded down. It was found, however, that the bridge was too loosely jointed to give a substantial structure so that the two bridges of this type lasted only a few years.

In 1892 a vertical lift bridge was built at South Halsted Street under J. A. L. Waddell's patent. This was like a giant elevator in which a steel truss span 130 ft. long by 58 ft. wide, weighing 280 tons raised vertically between steel towers to a height of 155 ft. above river level to permit vessels to pass. The lift span was suspended from wire ropes passing up over large grooved wheels at the tower tops and down again

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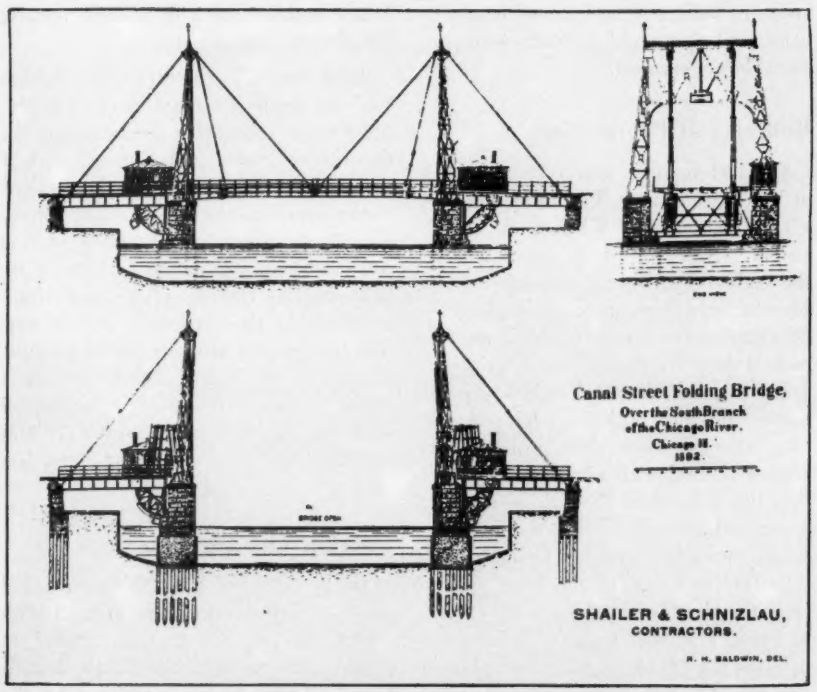

Figure 4. Canal Street Bridge, 1892.

Figure 5. South Halsted Street Bridge, 1892.

Figure 6. Van Buren Street Bridge, 1894.

to large blocks of cast iron that balanced the weight of the lift span. (See Fig. 5) The cost of this bridge was $242,880 and the structure served traffic until 1932. However, maintenance costs were high and the appearance of this type was such that no more like it were built until 1938 when the Torrence Avenue bridge, over the Calumet River, was built. By this time construction science had developed so far that this type could be built and maintained economically, and also could be made with presentable appearance.

Rolling Lift Bridge Built

In 1894 another new type was built at Van Buren Street, known as a rolling lift bridge under William Scherzer's patent. (See Fig. 6) It was hailed as the embodiment of an eleventh century idea brought down to date, as the combination of the bascule, which was the most common type of medieval moat bridge, and the latest electric and pneumatic appliances, it being equipped with two 50-horsepower electric motors on each leaf, and with air brakes. In detail, the tail-end of the bridge was like a segment of a wheel which rolled on a track, through an angle of slightly less than 90° so as to lift the front arm to clear the river for masted vessels. Several bridges of this type, with improvement in later bridges, were built, but in general did not prove entirely satisfactory.

About this time, the proposed construction of the Drainage Canal gave a great impetus to bridge construction, and also increased its difficulties. In order to provide channel cross-section area sufficient for the increased flow through the Chicago River and the South Branch, it was found necessary to remove about a dozen swing bridges with their obstructing pivot piers, while some of the longer bridges were spared for future replacement with bridges meeting the altered requirements.

Accordingly, in 1899 the City's Bridge Division made a critical analysis of the literature on movable bridges built in the United States and Europe, with a view to selecting a type of bridge suited to the requirements of the Chicago River and its branches. The results of this analysis were put in the form of a report showing the advantages and disadvantages of the various types in use. The type known as the trunnion bascule, in which the bridge rotated on short axles through each truss, was considered to be the one that could most fully and satisfactorily meet Chicago's requirements.

Develop Chicago Type

In the spring of 1900 bids were called for the construction of bridges at 95th Street over the Calumet River and at Division Street over the North Branch Canal. Three designs prepared by the City, with only minor differences, and five designs submitted by outside parties were analyzed by a board of consultants who selected one of the city types. This board, however, made certain recommendations which were incorporated into a design for a bridge at Clybourn Place (now Cortland Street), which was placed under contract late in 1900. Due to construction difficulties at the first two bridges named, the Clybourn Place bridge was completed first, in 1902. (See Figs. 7 & 8) From this time up to the present date, 39 bridges of the so-called Chicago type have been built. Quite naturally the bridge today is quite different from the original examples, but the fundamentals are the same.

Early Characteristics

The early bridges of this type were double-leaf structures having three trusses that were shallow near the center of the river, without overhead bracing, becoming deeper as the shores were approached with overhead bracing where the height became sufficient. The tail-ends were formed in a circular curve with center at the trunnions about which the bridge rotated. Pins were fitted in this curved tail-end, into which the cogs of large gears meshed, which gears were driven by electric motors causing the bridge to turn upon its axis. In order that the machinery did not have to lift the dead weight of the bridge, cast iron blocks were attached to the tail-ends of

the trusses so that the bridge was approximately balanced about its trunnions in all positions. The trunnions were supported on girders over a large masonry box into which the tail-end dropped as the bridge opened.

Later Refinements

Later developments have merely tended to perform these duties in better ways and the crude framing of early days has been improved greatly in appearance. Increasing weight of traffic, longer spans and wider bridges have necessitated the application of ingenuity as each new problem appeared. In retrospect these steps seem quite evident, but the actual development has required the best mental ability of many men over a period of 40 years. Discussion of all the developments is not the province of this article as it would involve deep technical analysis. However, a few of the main ones may be outlined briefly. Truss outlines have been greatly improved, enclosures have advanced from crude corrugated iron to ornamental masonry, operating mechanisms from simple hand control to semi-automatic devices with all necessary safety features, counterweights from cast iron blocks bolted to the trusses to large steel boxes filled with concrete and other materials as needed to provide the exact balance required, trunnion bearings from, babbitted bearings in the earlier bridges to roller bearings in the latest, floors from simple wood planking nailed to under timbers bolted to the steel, to substantial floors of steel or concrete or a combination of these materials, and still later to open steel grids.

The culmination of this development is evidenced in the award by the American Institute of Steel Construction of first prize in 1930 to the City of Chicago for the best looking bridge costing over $1,000,000 built in that year. This was the Wabash Ave. bridge.

Of course all new bridges since 1900 have not been exclusively of the Chicago type, as designers of other types have, from time to time, proposed their designs. Engineers in public service have always been of open mind and have been ready to investigate any new designs. In 1902 one such type was built at S. Ashland Avenue. This bridge, known as a "Page" bascule, utilized the weight of the fixed approach span to balance the movable span by means of an intricate roller arrangement so that the movable span was balanced in all positions. This bridge was removed in 1936 to make way for a wider bridge for the widened street. In 1911 a Strauss bascule bridge was built at Polk Street. This bridge varies mainly from the Chicago type in that the counterweight is not rigidly attached to the tail-end of

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Figure 7. Cortland Street Bridge, 1902.

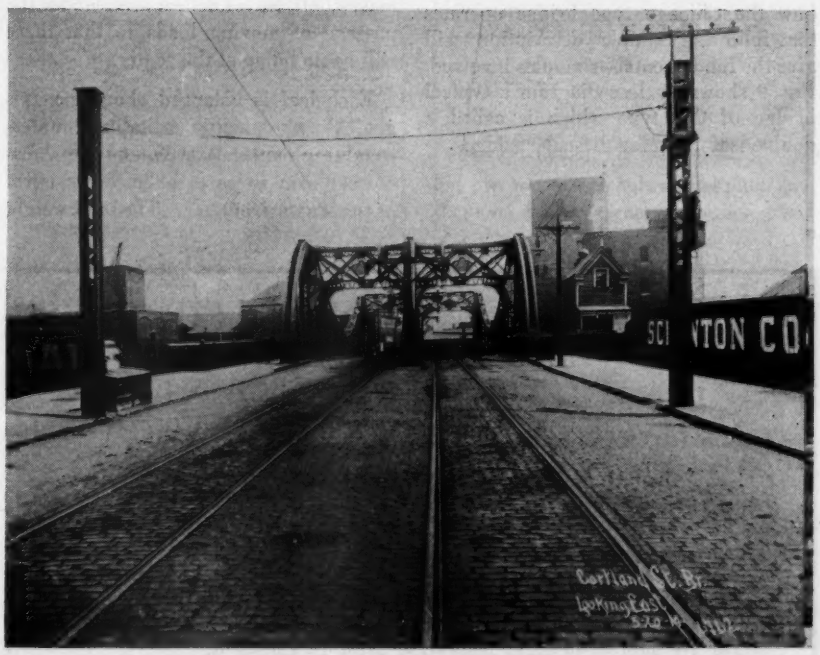

Figure 8. Cortland Street Bridge, 1902.

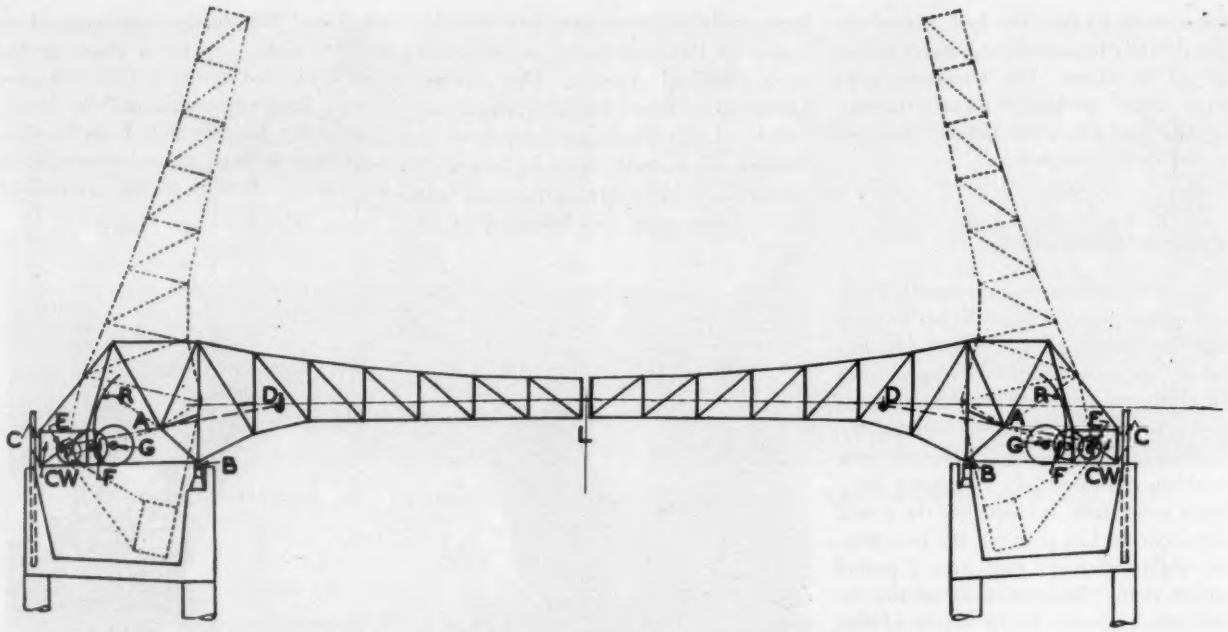

Figure 9. Diagram of typical Chicago type bridge.

the trusses but is attached thereto by pins so that it retains its upright position as it lowers into the bridge pits instead of lying over on its side as in the Chicago type.

For those who are interested in just how the Chicago type bridge operates the following simple description will give the fundamental principles involved. Fig. 9 shows by line diagram a typical bridge of this type which is called a double-leaf trunnion bascule bridge.

A complete bridge consists of two separate units or leaves which may be rotated about the axes at "A" thru an angle of nearly 90° so that the leaves take the dotted positions to permit the passage of vessels. When the leaves are down they are locked together at the center by means of a bolt at "L" which makes both leaves deflect alike under the passage of moving loads so that there will be no bump at the center.

Each leaf is balanced about the axis at "A" by placing suitable counterweighting materials (CW) on the shorter rear arm so as to balance the effect of the longer front arm. The total weight of the entire leaf exclusive of the counterweight may be assumed as concentrated at a point "D" where its rotational effect about the axis "A" is identical with the rotational effect of the weight as actually placed. This point in technical language is called the center of gravity. A similar center of gravity of the counterweight exists at "E." In order that the bridge will balance about the axis "A" in all positions of rotation it is only necessary to adjust the placement of the counterweight so that its center of gravity "E" is on the line "DA" extended, or as nearly so as is practicable.

This balancing is for weight of the leaf only as it would not be possible to provide a varying counterweight of just the right amount to balance moving loads, hence a different means is used to balance moving loads on the bridge. When the leaf is rotated to its down position it comes in contact with a rest at "B" supported on the front wall of the masonry tail-pit and simultaneously a bumper on the rear end of the bridge at "C" comes in contact with a bumping block attached to steel columns embedded in the rear wall of the tail-pit. It may now be seen that when there are moving loads on the front arm of the

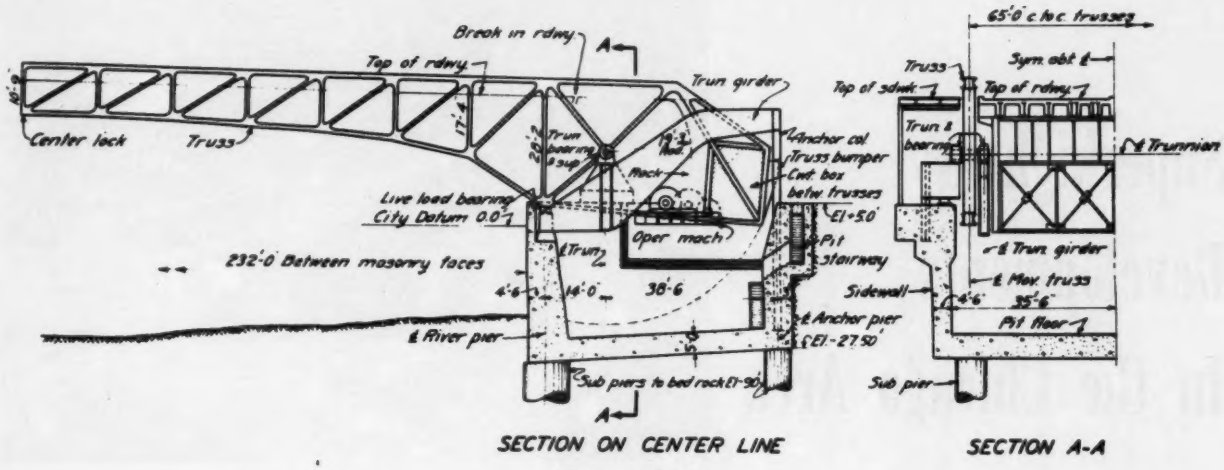

Figure 10.

leaf it tends to rotate about "B" causing an upward force at "C" which is carried to the masonry which must be heavy enough to take the maximum uplift when the bridge is fully loaded. When it is necessary to open the bridge it is done by means of a motor-driven train of gears at "F," one of whose gears at "G" meshes with a rack at "R" causing the leaf to rotate about the axis "A".

Fig. 10 shows how these principles were worked out for the Wabash Ave. bridge.

Usually, a person thinks of Chicago as a city of movable bridges, but in the outer reaches of the rivers fixed spans are feasible and the city has 26 of these. This does not include structures which carry streets over railroads or other streets, or railroads over streets, in the numerous grade separations about the city. These are normally referred to as viaducts, of which the City owns 11, and many more belong to the railroads.

Superhighway Developments In the Chicago Area

Traffic Interchange To Be Built East of Chicago's New Post Office.

Three authorities from city, county, and state highway departments are directing the design and coordination of a vast network of superhighways to serve the Chicago metropolitan area.

The plans were described before a joint meeting of Western Society of Engineers, sponsored by the Traffic Engineering and City Planning and the Hydraulic, Sanitary, and Municipal Engineering sections, held November 28.

The speakers, who comprise the Design Committee to discuss and analyze plans, were Dick Van Gorp, Chief Engineer of the Chicago Department of Subways and Superhighways; Charles H. Apple, Division Engineer, Illinois Division of Highways, and Hugo Stark, assistant Chief Engineer, Cook County Highway Department.

Described as "too large for any one body" to handle, the engineers have spent the last year or two studying the problem and doing preliminary planning prior to actual construction.

The initial program consisting of 33 miles within the city limits, which has been started, will cost an estimated $205 million alone, according to Van Gorp.

Added to this will be the $3,600,000 Edens Parkway, the Congress St. extension in the western suburbs, and the Calumet Parkway connection with the new Tri-State Highway, all in Cook County outside the city.

And all this may only be the beginning of the immense construction requirements of new residential and commercial developments stimulated by the expressways, the meeting was reminded by H. Evert Kincaid, chairman of the sponsoring groups.

Financing Available

Carl L. Gardner, executive director of the Chicago Plan Commission, who served as moderator of the session, agreed with the optimistic appraisal of future prospects given by the experts.

Apple said that by 1957 a program can be financed which will include the Congress St. west route, the northwest superhighway to link with Edens near O'Hare Field, the Wacker Dr. double-decking downtown, the Orleans and Ohio St. cross-connections, and the Outer Dr. northern extension from Foster Ave. to Hollywood Pl. All can be completed by that time, he added.

Both the Edens and Calumet routes are well under way, it was pointed out, with only five structures, and a $6 million paving section from Foster Ave. to the Lake-Cook county line, remaining to be placed under contract next year on the former project. Both are scheduled for completion by the end of 1951.

Stark said plans are expected to be ready for bids next year on a five-mile, $2 million section from 142nd St. to the Indiana line which will virtually complete the Calumet-Tri-State hookup.

Continuous-type wide-flange girders are being used on the Edens structures, Stark explained, in order to expedite construction. The first unit in this project, the Caldwell Ave. grade separation, was opened to traffic last week.

On the Wacker Dr. double-decking, the first section from Lake to Randolph Sts. is almost 50 per cent completed, the Randolph-Washington St. link is awaiting award, and bids will be requested on the Washington-to-Madison St. section next year, Van Gorp reported. The remainder of this improvement, south to Congress St. at grade, will follow.

The Chicago Park District expects to have riparian rights acquired for the northward Outer Dr. extension by 1951, Van Gorp said, and plans may be ready in February for figures on the Foster Ave. overpass, first structure in this undertaking. Fill work and grading also will be let by the Park District early next year, he said.

Congress is Feature

It is to the Congress St. artery, however, that the most vigorous immediate efforts are directed, the speakers made clear. Demolition of existing buildings is well advanced on the first section and right-of-way has been acquired west to Cicero Ave., Apple advised the WSE members.

The Canal to DesPlaines St. elevated section, a continuous beam structure to be built on caissons, will be a $4 million contract ready for letting about March 1, Stark said, while preliminary plans are

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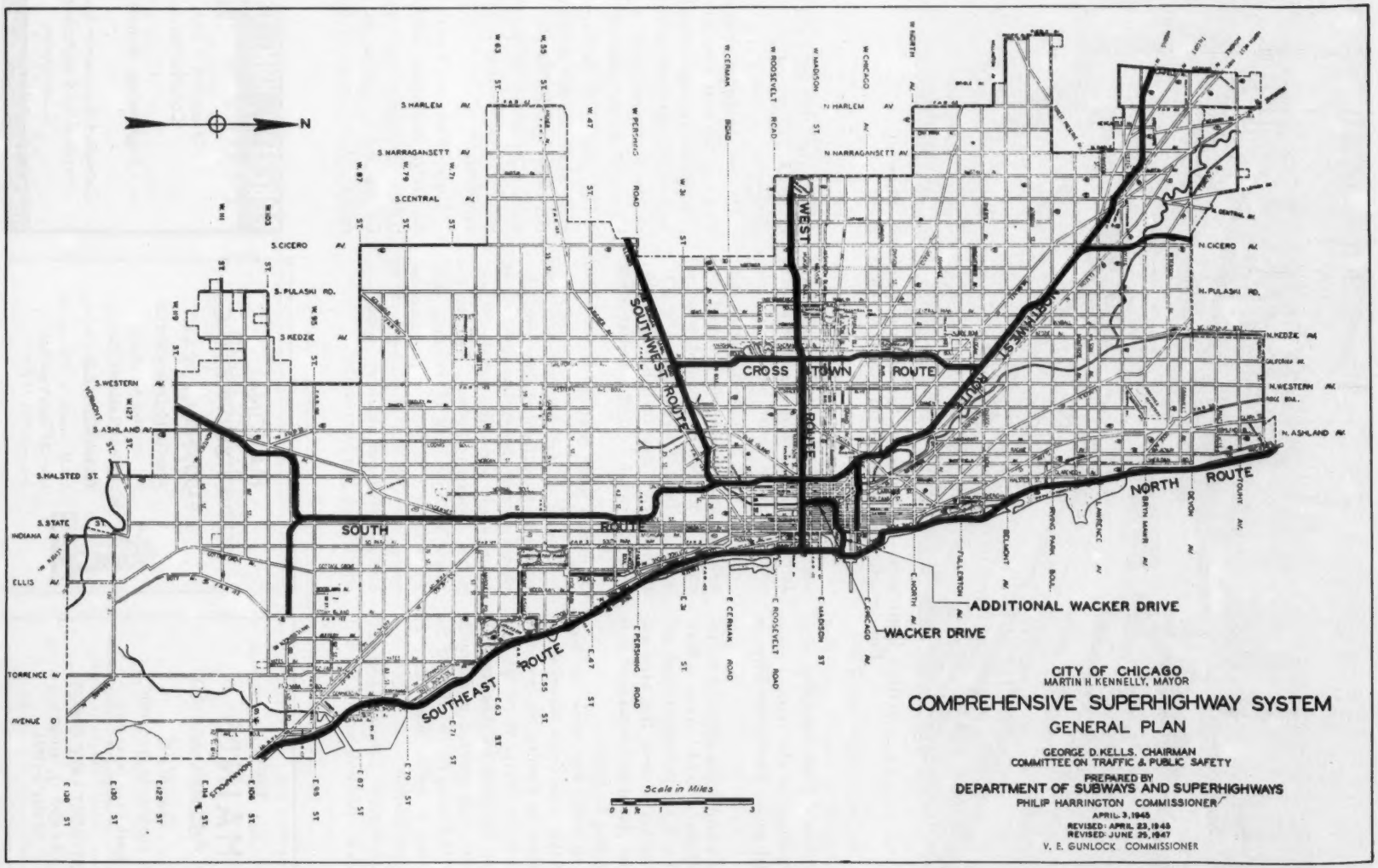
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W. CERMAK ROAD
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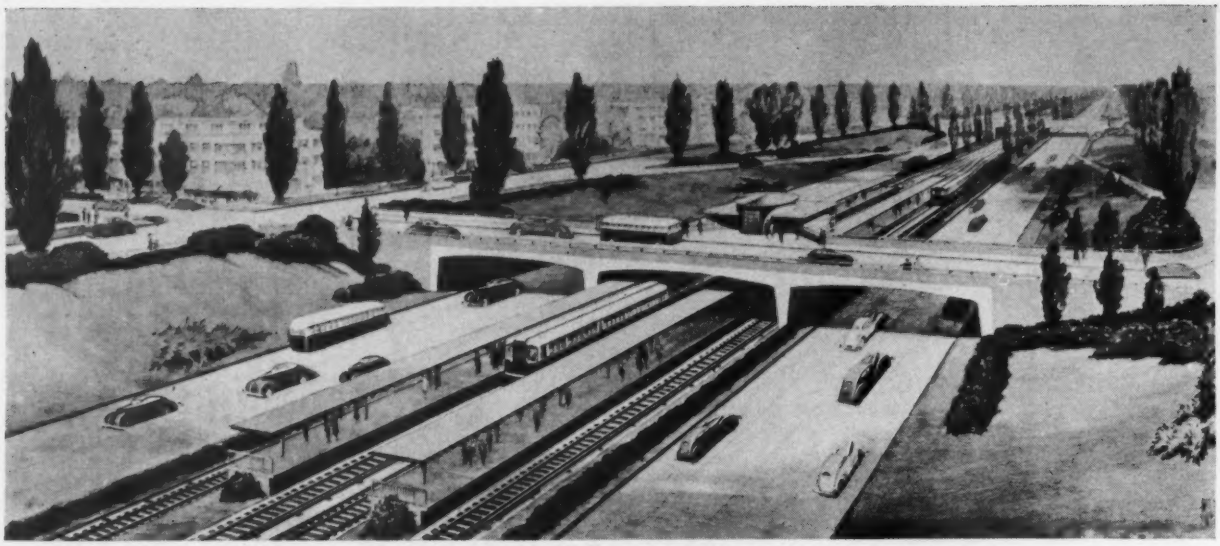
COMPREHENSIVE SUPERHIGHWAY SYSTEM
GENERAL PLAN
GEORGE D. KELLS, CHAIRMAN
COMMITTEE ON TRAFFIC & PUBLIC SAFETY
PREPARED BY
DEPARTMENT OF SUBWAYS AND SUPERHIGHWAYS
PHILIP HARRINGTON COMMISSIONER
APRIL 3, 1945
REVISED: APRIL 23, 1946
REVISED: JUNE 25, 1947
V. E. GUNLOCK COMMISSIONER



Artist's Conception of Congress Street Superhighway Showing Four-track Median Strip for Rapid Transit Lines.

(*Continued from Page* 10)

near completion on the portion from Austin Blvd. to the DesPlaines River in Oak Park.

Right-of-way is being acquired for the extension from 1st to 24th Aves. in Maywood, and a drainage sewer tunnel and pumping station to serve this area will probably be placed under contract next year, according to Stark.

Van Gorp noted that work has been started on the main drain tunnel sewer for DesPlaines to Paulina Sts. and that bids are in on the Peoria St. bridge. The 1950 letting program for Congress St. he indicated, will include a pumping station at DesPlaines St. the Halsted St. overpass, and a traffic interchange at Congress and Wacker.

A unique feature of the Congress St. project, it was observed, will be the first use in the U.S. of a median strip for a four-track mass transportation system to carry the rapid transit lines.

This in itself presents a difficult engineering problem, Apple declared, because a temporary elevated structure must be built first to carry the "L" trains during construction. Then they will be relocated in the median strip.

Tunnel Under Station

Typical of the projects ingenious planning, an agreement has been concluded to run the expressway at 3 ft. below grade under the LaSalle St. station's railway trainshed. Another example is the system of arcading sidewalks in the first floors of buildings between State St. and Michigan Blvd. to obtain maximum roadway width, on which work has been started.

The target date for completion of the Congress St. project is 1954, it was disclosed.

On the projected northwest superhighway, the next year will be devoted to right-of-way acquisition, the speakers said. Then will come preliminary work on the southwest route, to follow the Illinois-Michigan canal bed.

The portion of the expressway program within the city is financed under a three-way split by the city, county and state, with about 50 per cent of the latter's funds coming from federal-aid allotments.

Apple, Stark and Van Gorp comprise the design committee which meets regularly to coordinate planning operations for the three agencies in consultation with the U.S. Bureau of Public Roads.

OFFICERS AND ENLISTED MEN INVITED TO JOIN RESERVE UNIT

Thirty-nine former officers have the opportunity to band together in a WSE-sponsored reserve unit, if they come to an organization meeting on Wednesday, January 25, 7 p.m., at WSE headquarters.

Twenty-six men attended the first meeting held December 20, but thirty-nine are required before the unit can be started. Negotiations are being, implemented to actually form the unit as a result of the preliminary meeting, but until the goal is reached, the unit cannot get underway.

Previous branch of service is immaterial. Selection will be made on the basis of present qualifications for service in the Engineers to which TRANSFERS CAN BE EFFECTED FROM ANY BRANCH OF SERVICE.

This Engineer Construction Brigade will be the top level construction unit of the Army Reserve in this area. In active service it plans and controls the Engineer phases of large operations and includes in its roster assignments for specialists in all fields of engineering including civil, architectural, railway, highway, hydraulic and sanitary, electrical, mechanical and petroleum engineering.

PRESTIGE

No other unit in this area offers the prestige associated with membership in this top level unit with your fellow WSE members.

CENTRAL MEETING PLACE

Membership involves attendance at semi-monthly 2-hour conferences at WSE headquarters, 84 E. Randolph Street, convenient to all means of local transportation, including the outer drive.

PAY FOR DRILLS— RETIREMENT BENEFITS

This is a TO&E unit and receives top priority in number of pay drills. Each member receives one day's pay at the regular rate for his grade for each drill or conference attended and each attendance counts toward the government pension payable under certain conditions at age 60.

PLENTY OF "BRASS"

Officer grades are as follows:

1 Brigadier General
1 Colonel
1 Lieutenant Colonel
16 Majors
15 Captains
5 Lieutenants

All WSE members with previous commissioned or enlisted military or naval service are cordially invited to attend the initial organization meeting in the small auditorium at the WSE Headquarters, January 25 at 7 p.m. Colonel Hardin, Great Lakes Division Engineer, will be present to assist the committee in further explanation of the details.

Fill in the blank below and return it to Western Society of Engineers, 84 E. Randolph Street *NOW*.

Gustav Egloff
President

I will attend the Reserve Corps Meeting January 25, 1950.

Name_____

Mail Address_____ Tel._____

Previous Service: (please check) Army _____ Navy _____ Air Corps _____ Marines _____ Rank held_____

I am not / I am a member of the Reserves.

Present employment: (please check) Arch. Engr._____ Civ. Engr._____ Chem. Engr._____ Elect. Engr._____ H&S Engr._____ Mech. Engr._____ Pet. Engr._____

AISC President Predicts Good Year for Construction Field

The fact that designers of buildings and bridges in many parts of the country are unusually busy augurs well for a large volume of construction in 1950, N. R. Patterson of Tulsa, Okla., president of the American Institute of Steel Construction, said in a year-end statement. He based his statement on a survey just completed by the Institute, in the 15 engineering districts into which the country is divided.

"On the basis of present bookings and future backlog, the 1950 shipments of structural steel should equal those of 1949 and perhaps exceed them by 5 to 10 per cent," Patterson said. "Though superficial signs point to slackening in some lines of building this year, underlying factors seem to indicate a steady and solid trend of continued activity in the building field.

"Light occupancy structures such as hospitals, office and commercial buildings, schools and churches will be responsible in 1950 for a considerable increase in steel tonnage. On the Pacific coast alone, for example, the trend to steel frame school buildings with glass block fenestration will result in substantial tonnage increases.

"Defense structures, largely of steel construction, in Alaska and in the southeast, will be responsible for considerably more steel tonnage, for which figures cannot be divulged at this time.

"Such items as a new skyscraper office building in St. Louis, huge highway programs in California and other western states, considerable municipal work in Ohio and other midwestern states, and in mid-Atlantic states a surprisingly high demand for new church and apartment buildings, indicate that America is still woefully underbuilt.

"It will be five years at least before the country has anything like the number of large private, semi-private and public structures that its present needs call for.

"An encouraging sign is the resumption of near-capacity production by the steel mills. The fabricated structural steel industry was considerably slowed down by steel mill and coal strikes in 1949, so that we reached a tonnage of only 1,500,000 tons instead of the 2,000,000 tons the nation needed. However, barring work stoppages, in 1950, we shall go a long way toward catching up. I foresee a better year than 1949 for our industry."

Four Firms Receive Awards

Four Chicago firms have received contracts totaling more than $150,000 from Illinois.

Contracts awarded for construction of new stairways and elevators in the Illinois Eye and Ear Infirmary are as follows:

W. E. Boyington Co., general contractors, $82,274; M. J. Corboy Co., plumbing firm, $37,980, and Elevator Manufacturing Co. of America, $16,855.

Harvey Wrecking Co. was awarded a $14,900 contract for removal of eight buildings on Congress Street.

Western Society of Engineers Announces New Contest

The Western Society of Engineers announces a new competition open to all of its members.

Cash awards will be given for the best papers on subjects related to any phase of engineering. Three awards, totaling $500.00, will be given. First prize will be $250.00, second $150.00, and third $100.00. Funds for the prizes were donated by members of the Board of Direction and other interested members.

Papers will be judged on originality, editorial merit and value to engineering. They will not be presented orally, and may be of any length. The winning papers will be published in *The Midwest Engineer.*

Notice of intent to enter the competition should be sent by March 1, 1950 to the Executive Secretary of the Western Society of Engineers, J. Earl Harrington. Papers must be submitted to the Awards Committee of Western Society of Engineers not later than May 1.

The prizes will be presented at the Annual Spring Dinner to be held May 29, 1950.

WSE Speaker Describes Experimental Atomic Bomb Bursts

Destruction of material about the size of a peanut out of a total amount about the size of a grapefruit built into a bomb, caused the atomic bomb destruction in U. S. Navy tests off Bikini Atoll, according to Forrest Nagler, Chief Mechanical Engineer, Allis-Chalmers Manufacturing Company, who spoke before the Western Society of Engineers, December 12.

Nagler, who witnessed the underwater burst at Bikini as a guest observer of the Navy, added that the included active material may have weighed twenty pounds. He pointed out that the bomb was inefficient because the material, through its very violence of reaction, would blow itself apart before the action was completed.

Nagler said that one of the outstanding impressions received in his association with atomic scientists at Bikini and elsewhere has been the remarkable accuracy of their predictions.

"It must have been a tremendous experience for the scientists devising, by mathematical analysis, a new element—plutonium—which no man had ever seen, and which was non-existent in the universe," he said, in commenting on work prior to the first explosion. "They did not fear uncontrolled chain reaction but could advise the experimental crew at Los Alamos, New Mexico, to go a distance of ten or twenty miles, lie down on the ground, feet to the bomb and cover their eyes."

While all air bursts of the bomb had made columns about eight miles high, scientists predicted the underwater burst could be about one and one-half miles. It measured slightly over 8,000 feet, said Nagler. He said he was told in advance the height of the wave at the nearest ships might be 100 feet and between five and nine feet at the Bikini shore, two miles away. Actually, it measured something like 93 feet at the nearest ships and 7.4 feet at the Bikini shore.

Contrary to general impression, Nagler said radioactivity took the lives of perhaps only twenty per cent of the persons killed in the two Japanese atomic bomb raids and that the other deaths were from causes incidental to normal bombing. He pointed out that large quantities of radioactive material that were potentially deadly were part of the high column, carried up by chimney effect, and dispersed at the high altitudes.

However, he said that in the water burst most of the radioactive material came down with the large column or cloud of water which descended as rain. Such an underwater blast on the up-wind side of a city could produce an umbrella of rain two or three miles wide which would leave little life when blown across the city.

Nagler said scientists originally considered that the desired form of uranium (235) could be feasibly separated from pitchblend, or uranium ore, in four ways: by centrifugal force; by a similar magnetic spinning of the atoms, in either gaseous or liquid form; by a thermal method; or by a filtering or diffusion method of pumping it through a fine screen or barrier. The second method produced the first material available for bombs, but it was later made obsolete by the fourth.

Allis-Chalmers, said the speaker, built a number of tremendously large electromagnets weighing thousands of tons, as much as a cruiser, and containing several hundred million dollars worth of silver from Fort Knox. The silver was used since there was not enough copper available. These magnets were used in the second method.

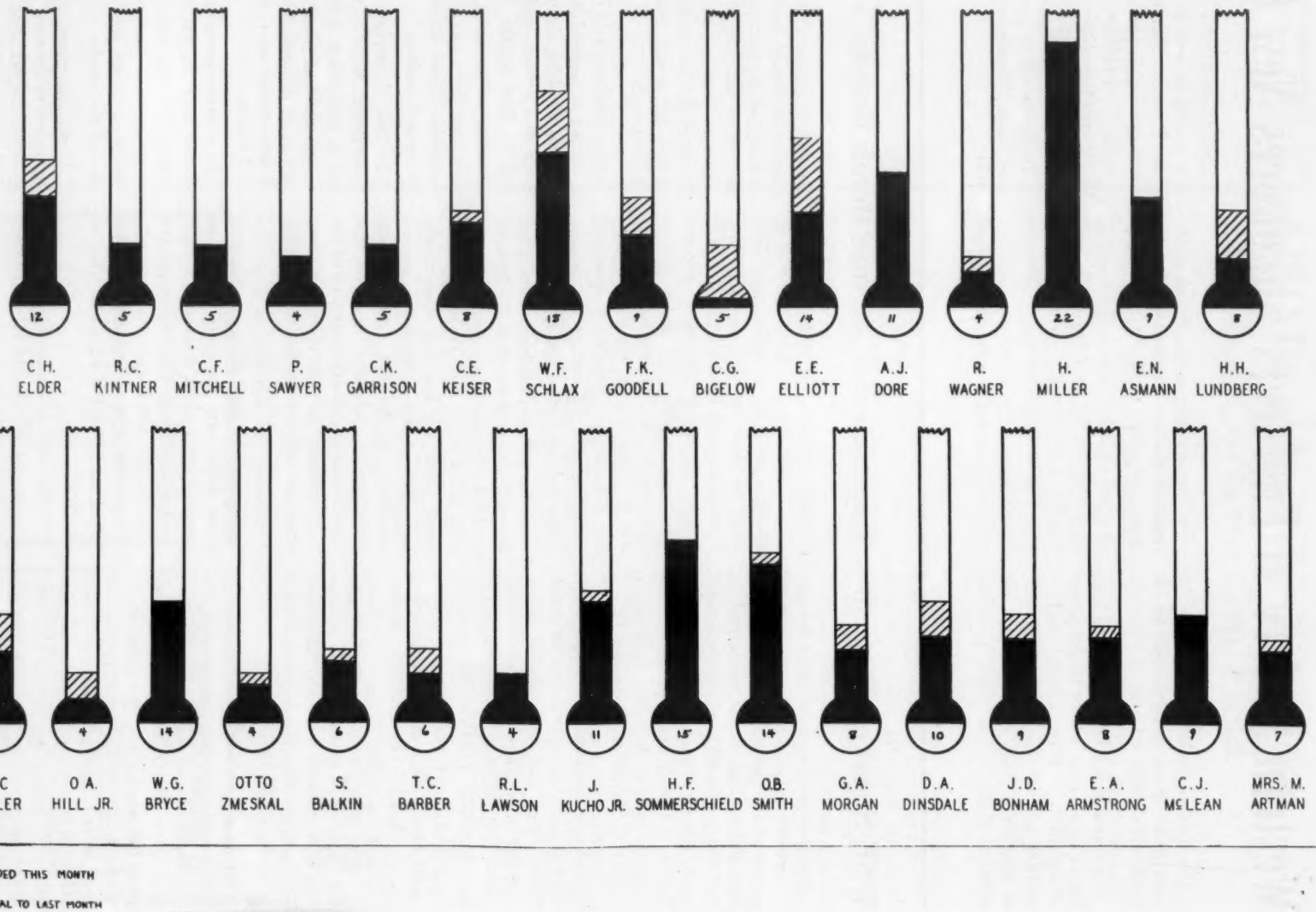
In 1943, at the direction of the U. S. Government, Allis-Chalmers erected, and had in production within seventy days, a new plant producing pumps, necessary in the diffusion method. Thousands of these pumps were sent to Oak Ridge, said Nagler.

In connection with his talk, Nagler showed the U. S. Navy sound film, "Operation Crossroads," describing the many scenes of the preparation for the two bomb blasts, and the actual explosion of the bombs.

As with so many of the WSE meetings, most of the very interesting details presented by Mr. Nagler cannot be reproduced, and his excellent delivery of the subject cannot be adequately reflected.

WESTERN SOCIETY OF ENGINEERS
MEMBERSHIP DRIVE
(RELATIVE ACTIVITY CHART)

277
NEW APPLICATIONS (TO JANUARY 1, 1950)



Starting the New Year Right!

THESE MEMBERS ARE BUSY GETTING NEW MEMBERS FOR WSE

Allen, A. G.
Anderson, Bolton G.
Anderson, R. E.
Andrews, F. E.*
Artman, Mrs. M. E.
Bailey, G. G.
Balkin, S. F.
Becker, Donald N.
Benoit, Wm.
Bernhard, Leroy F.
Brewer, A. H.
Bradley, B.
Burt, George H.
Buxton, B. L.
Beattie, C. S.
Carlson, A. C.
Carlson, W. W.
Coxe, H. A.*
Culp, E. R.
Dartsch, F. A. L.
Davies, F. C.
DeLeuw, C. E.
DeWolfe, E. C.
Dinsdale, David A.*
Doyle, T. M.
Edwards, F. W.*
Egloff, Gustav
Elder, Clarence H.
Elliott, E. E.
Epstein, A.
Fischer, David J.
Flood, Paul
Frederick, T. C.
Gabbard, L. C.
Garrison, C. K.
Goodell, F. K.
Gordon, B. A.
Gould, G. Frederick*
Graham, I. E.
Gray, Walter
Guthrie, R. M.
Griesel, Margaret
Hall, George S.
Halperin, Herman
Halvorsen, Ralph
Hanson, C. D.
Hanson, R. M.
Holt, N. C.
Howson, A. W.
Hecht, J. L.
Herr, C. C.
Horneman, Miss B.
Huff, Julius
Humiston, J. F.
Imhoff, E. A.
Jackson, A. L.
Jelinek, O. K.
Johnson, Elmer A.
Kahler, W. V.
Kawiecki, C. J.
Keith, A. W.
Kelly, R. R.
Kerr, A.
Kintner, R. C.
Klammer, K. K.
Kraft, John E.
Kreller, R. A.*
Kocsis, P. Jr.*
Kucho, Joseph
Lagerstrom, Harry*
Langdon, L. E.
Larson, M. N.
Lauritsen, C. N.*
LeClair, Titus G.
Lockwood, L. E.
Lundberg, H. H.*
McClurg, V. O.
McCallum, V. E.*
McKee, K. E.
McLean, C. J.
Maney, F.
Marsh, Edward J.
Marston, W. R.
Mee, C. L.
Melnick, T.
Michaels, E. E.
Miller, Herbert R.
Mitchell, Chester F.
Mittelmann, Eugene*
Murphy, Miss M. L.
Nielsen, E. R.
Orloff, Melvin
Penn, J. C.*
Perkins, Miss R.
Peterson, Jas. Edw.*
Peterson, Ralph S.
Pillsbury, C. S.
Randall, Edwin A.
Rettaliata, J.
Rivenes, A.
Rogers, D. E.
Ruzich, J. L.
St. Germain, A.
Salzman, A. L.
Sargent, Ralph
Saunders, N. H.
Sawyer, Percy
Scaar, Harry
Schick, N.
Schirmer, R. W.
Schlesinger, L.
Schoonover, Howard
Schmitz, C. E.
Schutte, L. H.*
Scopelite, J.
Sedwick, H. P.
Seymour, C. W.
Sikes, A. W.
Showtis, B. M.
Simpson, G. N.
Skog, Ludwig
Smith, D. L.
Smith, F. C.
Smith, O. G.
Smith, Osborne B.*
Sommerschield, H. F.
Spencer, A. L.
Strazz, A. J.
Stump, R. D.
Sykes, Wilfred
Taylor, O. H.
Tornquist, E. L.
Tuttle, L. W.
Vanderkolk, W. W.
Vivoda, J. V.*
Wade, J. William
Walker, C. W.
Weeks, L. E.
Whitehead, E.
Whiting, F.
Wier, R. J.
Wilkins, D. C.
Williams, Kenneth
Williams, G. M.
Willet, G. R.
Wisner, G. F. Jr.
Wolfe, Thomas
Wilson, J. R.
Woloshin, Boris
Zermuehlen, H.

* Since last period.

City Council Approves Filtration Plant Site

The Chicago City Council on November 29 approved a site in Lake Michigan a short distance east of Lake Shore Drive and 400 feet north of Navy Pier for a 950 MGD, $76,000,000 combined central and north district filtration plant.

The site approved for the location of the plant is approximately 1000 feet east of the site recommended by the consulting engineers who had been retained by the City to advise on the details and location of the plant.

The approval of the site culminated a study of almost three years by the City Council and its committees, and by the engineering staff of the Department of Public Works, which will have charge of the design and construction of the plant. During the 3-year period, studies were made on ten alternate locations for the combined plant, as well as numerous studies on the alternate possibility of building two plants; one for the central district and another for the north district. These studies indicated that a combined plant, at or near the site recommended by the consultants, would have both the lowest construction and operating costs.

The site recommended by the consultants (immediately east of Lake Shore Drive) would have had slightly lower original cost (approximately $74,000,000 at present day prices), but locating the plant at that location was opposed by Lake Shore property owners as violating certain agreements when Lake Shore Drive was built. It is claimed that by moving the plant to the east, there will be no violation of riparian or other rights and the City, for this reason, was justified in approving the latter site.

The area to be occupied by the plant is 1100 feet wide and approximately 2500 feet in length, containing about 60 acres. The depth of Lake Michigan in this area is approximately 16 feet so it is proposed to construct a cofferdam and de-water the entire area previous to beginning the construction of the plant proper.

The Filtration Design Section is under the direction of W. W. DeBerard, City Engineer and O. E. Hewitt, Commissioner of Public Works. Mr. F. G. Gordon is Assistant City Engineer in charge of design and Mr. J. R. Baylis is Engineer of Water Purification. The consulting engineers were S. A. Greeley of Greeley and Hansen and L. R. Howson of Alvord, Burdick and Howson.

Dougherty Will Receive Moles Award in N. Y.

Richard E. Dougherty, retired vice-president of the New York Central System in charge of improvements and development, will receive the tenth annual Moles award for outstanding contribution to construction and for his exemplary career as a citizen, according to Carlton S. Proctor, president of The Moles, the association of leaders in America's heavy construction industry. A bronze plaque and parchment citation will be presented to Mr. Dougherty, whose distinguished career embraced railroading, civil engineering and public service, at The Moles tenth annual award dinner Feb. 9 at the Waldorf-Astoria Hotel, New York.

Distinguished Career Cited

Concerning Mr. Dougherty, Mr. Proctor said, "As principal engineering executive of the New York Central, Mr. Dougherty has made special contributions to both railroading and civil engineering in America. In addition to his forty-six years in furthering the growth and value of his company, he has given his time unselfishly to improve public transportation through his efforts in removing grade crossings, improving terminal and station facilities, in promoting safety and in city and port planning. As a practicing engineer he has introduced many conveniences and economies through his planning and construction of such facilities as rail lines, bulk terminals, the improvement of roadbeds and other measures for speedier service, through research and in the administration of belt lines and hotels, office buildings and other real property. His unusual talents have been amply recognized through leadership in professional societies. In choosing Mr. Dougherty, we do so with the intention of rewarding his efforts with the most cherished of prizes —the admiration and esteem of fellow workers."

He is a brother of Edward A. Dougherty (WSE), chief engineer of the Western lines, New York Central System.

Hold Second Career Conference at I.I.T.

Four thousand high school students from Chicago and Cook County schools attended the second annual Chicago Area Career Conference December 27, 28, and 29.

Dr. Gustav Egloff, WSE president and past president of CTSC, was a member of the general committee planning the conference, which is sponsored by the Chicago Technical Societies Council, the *Chicago Sun-Times*, and Illinois Tech.

Edward B. Simon, Cook County superintendent of schools, described the project as "one of the greatest educational endeavors ever to come to Chicago."

Mr. Simon said he had studied the European school system, and knew of nothing there to match the vocational guidance planning offered by the conference.

Dr. Egloff described the conference as "significant because our future is in the hands of our young people."

"By helping them to choose the occupation for which they are best fitted, we are building better citizens and better personnel for industry, business and the professions," he said.

Herold C. Hunt, general superintendent of Chicago public schools, described the conference as a "magnificent undertaking, worthy of the full support of all educators and students." Both men have key personnel working with the conference committee.

Msgr. D. F. Cunningham, superintendent of Catholic schools, also indorsed the conference, and representatives of his staff worked closely with the planning groups.

Midwest Engineer will reproduce excerpts from some of the talks in an early issue.

Personal

Col. Wendell P. Trower, recently made head of the Army engineer's procurement office in Chicago, was honored at the annual meeting of the Propeller Club for his role in the improvement of Chicago area waterways during his tenure as district engineer. Martin W. Oettershagen, Chicago harbor engineer, eulogized the 100-year record of the Army engineers in developing the nation's harbors and rivers.

Otto Jelinek Elected President of Illinois ASCE

Otto K. Jelinek (WSE) was elected president of the Illinois section of the American Society of Civil Engineers at the annual meeting of the Society, December 7. He succeeds C. H. Mottier (WSE), retiring president.

Mr. Jelinek, an associate of Ralph H. Burke Co., Consulting Engineers, is well known throughout the state for his leadership in public projects and civic improvement programs for many years.

He was with the Chicago Park District from 1918 to 1946, serving as traffic engineer and chief planning engineer during the development of the Park Improvement Program at a cost of $24,000,000. He was instrumental in developing Chicago's water front with such improvements as South Shore Drive, Burnham Park and Grant Park.

Among his notable designs, for which he holds the patent, is the Flexible Channelizer Traffic Flow System, in service on Lake Shore Drive, and with installations pending in other cities.

Mr. Jelinek is a director of the Equitable Savings and Loan Association, and is secretary and treasurer of the Singh Company, research engineers.

He is a graduate of Armour Institute (now I.I.T.), and is a registered engineer in Illinois, New York, Michigan, Wisconsin, and Indiana.

He received the Octave Chanute award in 1938 for a paper on civil engineering, and has been active in WSE activities, including the Transportation Section, of which he is the current chairman, and the Traffic Engineering and City Planning Section, of which he is a past chairman.

Other organizations in which he holds membership are the Institute of Traffic Engineers, Military Engineers, and the Chicago Plan Commission.

January Advertisers

WSE Personalities in the News

Eugene J. Stankiewicz, Chief Structural Engineer of Sargent and Lundy, has been admitted as a partner in the firm, according to an announcement on January 2. His application for membership in the Western Society of Engineers has been received.

* * *

L. F. Harza (WSE) returned recently from a trip around the world, during which he was consultant to the Turkish and Indian Governments, and to a Philippine power company. Among his stops were London, Istanbul, Cyprus, Damascus, New Delhi, Calcutta, Hong Kong, Philippines and Hawaii. He described his very colorful trip before a joint meeting of the student members of the A.S.C.E. from the Chicago Undergraduate Division of the University of Illinois, Northwestern Technological Institute, and the Illinois Institute of Technology.

* * *

John P. Gnaedinger (WSE) and Theodore W. Van Zelst (WSE) have recently expanded the activities of their firm, Soil Testing Services, Inc., Chicago, to include contracting for all types of foundation borings, performing laboratory and field tests on soils to determine engineering properties, and preparing analyses and reports on foundation conditions. The firm is also continuing the manufacture of its line of Soiltest apparatus.

John C. Penn (WSE), who was Professor of Civil Engineering at I.I.T., has retired.

* * *

Dr. Gustav Egloff, WSE President, appeared on Television Station WBKB, December 23, in a 15-minute discussion of the Second Annual Chicago Area High School Career Conference. Other participants were Dr. Herold C. Hunt, General Superintendent of Schools, and Dr. Edward B. Simon, Superintendent of County Schools.

He was a luncheon guest of Governor Stevenson on January 10 in Springfield, discussing the feasibility of holding a conference for the purpose of cutting down the death, injury and damage toll involved in motor vehicles of all kinds operating on our roads.

January 10 at 8 p.m. he addressed the American Society of Tool Engineers on the subject, "Oil in Industry."

Dr. Egloff gave a brief talk January 13 before the Columbia Alumni Club on "Our Oil Supplies—Are They Running Low?"

At the Annual Meeting of the Illinois Society of Professional Engineers on January 28, Dr. Egloff will participate in a panel discussion on the status of the professional engineer. Speakers represented various viewpoints including the professional engineer, organized labor, the legislator, and the law.

CRERAR LIBRARY Notes and News

The John Crerar Library extends to all of its readers the most cordial good wishes for a happy and successful 1950. And may the second half century far exceed all of the accomplishments of the half century just ended.

* * * *

The birth of Benjamin Franklin, January 17, 1706, is being celebrated by an exhibit in the Library during Printing Week in Chicago, January 16-21. Included in the exhibit are early American and French editions on Franklin's work on electricity, a report on the Philadelphia Hospital published by Franklin, other works, medals, etc.

* * * *

The Arithmetic of Biology

Research Information Service recently explored the literature on a problem relating to milking machines. One RIS Diogenes asked another, "How many cups has a milking machine?" The question was answered by a question, "Well, how many spigots has a cow?" The response was, "*Five.*" Humorously, the story was related to two others. One asked, "Well, how many are there?" The second surmised *four.*

Now the search was serious. That evening, a friend and his wife were asked the question. Simultaneously from living room and kitchen came the answer, "*Five.*" For expert advice a telephone call to a leading dairy brought from the startled evening attendant a request for identification—then, "Anyone knows that, it's *four.*" Score: three votes for *five;* two votes for *four;* with one not voting.

A neighbor was called in for consultation; and a new number was added —*two.* The next day, the neighbor asked several fellow workers in a department store. No one *knew.* Several guessed four. Other guesses ranged up to eight.

Later, when the client expressed satisfaction in the results of the RIS literature search, he was given the above story. "Never gave it a thought," he said, "how many are there?"

Any other Questions?

To Give Third Refresher Course

The first two refresher courses for the Professional Engineer examination have been so enthusiastically received, that a third course has been arranged, and a new course in preparation for the Structural Engineer examination has been established. The sponsors are WSE and the four founder societies, AIEE, ASME, ASCE, and AIME.

The Structural Engineering refresher course began January 5 and will continue through March 14. Students will attend twenty sessions of two hours each, at a cost of $16.50.

Examinations for Structural Engineers are held twice yearly in two sections, one oral and one written. The first exam will be January 26, oral; and March 21 thru 24, written. The second exam will be June 15, oral; and September 26 thru 29, written.

The Professional Engineer refresher course is tentatively set to begin February 20 and continue through April 26, 1950, preceding the examination in May.

As with the other courses, it will be taught by instructors from the University of Illinois' Navy Pier Branch, Illinois Institute of Technology and Northwestern Technological Institute. Twenty meetings of two hours each will be held. Test questions used in earlier Professional Engineer examinations will be used as a guide for the course. Tuition will be $16.50, payable at the time of registration.

Interested engineers should contact the Extension Division, Illini Center, LaSalle Hotel, Randolph 6-7750, the Western Society of Engineers, 84 E. Randolph St., Randolph 6-1736, or any of the other sponsors.

Background of Course

As readers of *Midwest Engineer* will recall, a temporary Inter-Society Educational Committee was appointed for the year 1947-48 for the purpose of considering a proposed educational program in the interests of the members of the engineering profession. This committee was made up of one member each from WSE and the founder societies.

After due deliberation a report was rendered in which two major recommendations were made:

(a) It was considered imperative that a refresher course designed to fit the needs of Professional Engineers wishing to take the state examination for registration as Professional Engineer be established as quickly as possible.

(b) It was further recommended that a broad, general non-technical program of instruction be organized which would approximately encompass the non-technical subjects generally included in proposed six-year college engineering courses. Suggested were courses providing training in effective self expression both by speech and writing, training in the economic and business structure of the nation, a study of the tools used in setting up cost and other financial data, and a contribution to a better understanding of the bases of human behavior. Specific subjects mentioned for the furthering of the broad aim were accounting, English, literature, economics, psychology and philosophy.

This first committee further recommended that the preliminary work be placed in the hands of a permanent committee composed of two members from each of the sponsoring societies selected for staggering two-year terms. It was recommended also that the Western Society be the active sponsors of the refresher course.

Members of the recommended permanent general committee were appointed for the year 1948-49 by the sponsors. The Illinois Engineering Council was added to this group late in the year. This new committee did the necessary exploratory work preliminary to the establishment of a refresher course. It has started work upon the broader general program. After the preliminary work the W.S.E. was charged with the administrative details, necessary and incident to the setting-up of the refresher course.

First Refresher Course

The WSE Educational Committee contacted the Extension Division of the University of Illinois as a possible source of instruction. It learned that this Division, in cooperation with the Navy Pier Branch, was about to establish a refresher course for professional engineers desiring to take the May, 1949, examination. The time was short, the course therefore was short, and consisted of ten periods of instruction. This course was looked upon by those presenting it as a test or pilot course. Test questions used in the earlier Professional Engineer examinations were used as background material. Forty-three persons were enrolled in the course, which proved very successful as attested by an unusually high attendance average.

Second Refresher Course

Since a refresher course was about to be established by a reputable technical school, at a tuition price much below the one anticipated, the WSE committee, with the approval of the Chairman of the Inter-Society Committee, decided the services of the Extension Division should be used. The Extension Division would provide instruction and classrooms with the cooperating societies acting as sponsors and giving publicity in their respective publications and in any other possible way.

This cooperative arrangement resulted in an enrollment of 90 students in the second Professional Engineer's course. This opened with registration at Navy Pier, Sept. 9, 1949, and ran through December 1, just preceding the December examination. Twenty sessions, each two hours long, were held, and average attendance was high. Again basic engineering fundamentals and examination questions were used as material.

For this second course instructors were provided by the University of Illinois Navy Pier Branch, Illinois Institute of Technology and Northwestern Technological Institute. The cooperating engineering societies thus found themselves in the happy position of having a highly desirable, special technical course jointly taught by instructors from the major technical schools of the Chicago area, for the direct benefit of the membership and that of the engineering profession in general.

SYNCHROCYCLOTRON

Being Built at University of Chicago To Create New Radioactive Atoms

The University of Chicago's new giant atom-smasher, currently expected to be in operation by September 1, 1950, has been assembled so accurately that its 2,200-ton electromagnet is at most 1/100th of an inch from being in perfect alignment.

This fact is contained in "Progress Report II" issued by the university's Institute for Nuclear Studies. Written by Associate Professor Herbert Anderson and Assistant Professor John Marshall, Jr., of the university department of physics, the report is a detailed account of the problems met and surmounted in constructing the new atom-smasher, technically called a synchrocyclotron.

When in operation, the synchrocyclotron will be one of the three most powerful in the world, unless the Russians have a larger one. The other two are at Columbia University and the University of California, but pack a slightly less powerful atomic punch.

Building the synchrocyclotron, designed to create new kinds of radioactive atoms and atomic particles never before studied in the laboratory, proved to be a monumental engineering job. The huge magnet is sunk in a watertight pit, at its deepest some 32 feet below street level. This is well below the level of ground water in this area, so that special precautions had to be taken against seepage.

Even though the heaviest single pieces of the magnet weighed 82 tons each, when its assembly was completed the two 170-inch magnet poles were found to be vertically aligned to within 5/1000ths of an inch. The slight deviation is not expected to affect the operation of the magnet.

Wrapped around the two poles of the magnet are four and a half miles of hollow two-inch copper square tubing. The total weight of the tubing is approximately 135 tons. These coils of tubing, arranged in hollow pancakes and stacked on top of each other, will carry water used to cool the magnet when in operation as well as conduct the electric current which operates the magnet. They were fabricated at the New York naval shipyard and had to be shipped to Chicago by water.

Between the two poles of the magnet is a stainless steel vacuum chamber, 19 feet square, two feet thick. It has been tested for leaks, found to be extremely air-tight. Eventually, when new pumps are in operation, it will take 40 minutes to create in its 722 cubic feet an air pressure two one-billionths of that of the air outside.

One big engineering problem in the job of building the tailor-made cyclotron was shielding the vicinity from the effect of the deadly atomic particles speeded up by the magnets. For that reason it was built in a pit so that the ground would stop some of the particles. Most of the protons hurled by the machine will be turned into neutrons before they are stopped.

Because some of the neutrons will travel with an energy of 450,000 electron-volts, great thicknesses of concrete are needed to protect the scientists who operate the synchrocyclotron.

"The most economical shield," the Institute report says, "appears to be a combination of steel and concrete." On one side of the shielding device in the pit will be a screen twelve feet thick. Six feet of this thickness will be steel, the other six feet will be concrete containing so much steel that it weighs 300 pounds a cubic foot. This screen will provide a shield against the atomic beam which is equal to a thickness of 31.2 feet of concrete alone.

The shielding over the top of the synchrocyclotron is made of reinforced concrete beams five feet thick. In some places, two layers of beams will give added protection. Over 1150 cubic yards of concrete will be contained in roof beams, each cubic yard of concrete weighing over two tons.

To handle the weight of these portable beams, the Accelerator building also houses a 100-ton crane.

Actually, as Progress Report II—which is a handbook for building a cyclotron—indicates, the Accelerator building itself is basically a $1,250,000 crane shed. The giant crane has proved to be a fundamental tool for experiments on the infinitesimally small nucleus of the atom. It was needed to assemble the huge electromagnet, to move the weighty concrete shielding beams, and for the work necessary during the operation of the synchrocyclotron.

In the course of developing the shielding, scientists at the institute developed a new instrument for detecting deadly radiations. This sensitive device can detect radiations ranging from those of an intensity far too small to be dangerous to those so potent a human being could be exposed to them for only four seconds a day.

The navy provided the bulk of the $2,200,000 needed for the construction of the synchrocyclotron. The remainder of the funds were provided by the University of Chicago Cancer Research Fund Drive in 1947. Like other atom-smashers, the synchrocyclotron is expected to speed research in combating cancer.

Says High Velocity Ventilation Coming

Air as used in ventilating and air conditioning systems can and will be handled at velocities from three to four times higher than those commonly employed today. Just as the handling of steam and liquids at greater speed has been a pronounced trend, so will air be moved at higher velocities. Today, economic considerations do not permit the use of building space for large ducts where smaller ones will suffice.

This opinion was expressed by Thomas H. Urdahl in a talk December 12 before members of the Illinois Chapter, American Society of Heating and Ventilating Engineers. A prominent consulting engineer in Washington, D. C., and, during the war, in charge of heating, ventilating and air conditioning in vessels of the U. S. Navy, he cited a number of examples, both commercial and naval, where high velocity systems have been used successfully.

Mr. Urdahl was consultant for the air conditioning installation in the Chamber of Commerce Bldg. in Washington. A number of slides showing the installation work were of interest to members. In order to conceal all work, marble slabs were removed, air ducts installed, and the marble replaced. Because of cramped spaces, aluminum tubing, originally developed for irrigation piping, was used to convey dehumidified air to the various rooms. Separate provision was made for sensible cooling in each room.

After pointing out some of the substantial savings in installation costs which can be effected by these systems, Mr. Urdahl mentioned precautions to be taken in order to avoid objectionable noise.

Auto Manufacturers Describe

COST-SAVING IN INDUSTRY

SPURRED by the sharp increases in wages, material costs and other operating expenses since the war, the automotive industry in the last four years has made faster progress than ever before in finding new ways to make cost savings, according to the Automobile Manufacturers Association.

Two main results have come from the cost-savings effort.

It has permitted vehicle makers to continue adding new engineering features and quality improvements with each postwar model change.

And second, it has let automotive firms hold postwar price increases well below the rise in U. S. family income.

For example, the U. S. Bureau of Labor Statistics reports that while motor vehicle prices are up 93 per cent since 1939, the average weekly wage of U. S. industrial employees is up 130 per cent.

In searching for new cost-saving methods since the war, automotive companies have gone far beyond their usual practice of making steady improvements in production machinery.

In fact, the big cost savings of the last few years have been in "non-productive" operations.

They've come in such fields as new mechanical methods for material handling, automatic inspection devices, better plant maintenance and repair practices, and improvements in packaging, purchasing methods and parts distribution.

The quest for cost reductions is now more highly organized in most firms than ever before, and covers every activity that involves large expenditures.

In one automotive firm alone, 96 technical committees are working today to make company dollars go further.

Any idea that looks promising is tested in one of the company's plants. If it gets results, a technical group spreads the idea to other plants.

Many of the ideas are simple. In one plant, for instance, a program for reducing leaks in compressed-air pipes was tested. It involved re-packing of air valves and taking out unneeded pipes.

When the program showed savings, it was put in force at all plants using compressed air. In the last year, it saved the company $100,000.

Industry officials point out that the most remarkable results of this all-out effort to cut costs is that it permits them, in spite of today's higher wage rates, to build vehicles that require more "production labor."

Today nearly 800,000 persons work for U. S. automotive firms, or 71 per cent more than in 1939. And with wages now nearly $70 a week, compared to $32.91 in 1939, the industry's total wage bill is more than triple what it was in 1939.

Part of the increased employment is due to today's higher production volume. But automotive firms report that the average motor vehicle today, because of postwar styling and new engineering features, requires substantially more man-hours of labor to build.

So by mobilizing all their technical and managerial skill for the task of finding new ways to reduce costs, the nation's car and truck makers have been able to employ more people at higher wages, build vehicles with more "labor content"—and still keep prices at a level where more people buy motor vehicles today than ever before.

Announce Changes at U. S. Steel

Charles R. Cox has resigned as president of Carnegie-Illinois Steel corporation, United States Steel subsidiary, Pittsburgh, to become president of Kennecott Copper corporation, New York, according to Benjamin F. Fairless, president of United States Steel. In assuming the presidency of Kennecott Copper on Jan. 1 next, Mr. Cox will become head of the largest copper-producing company in the world. He succeeds in this office the late E. T. Stannard, who recently died in an airplane accident in Canada.

Mr. Cox has been a leading figure in the steel industry for many years. He is widely known both in this country and abroad as one of the leading operating men in the steel industry. He became president of Carnegie-Illinois Steel corporation, the largest steel-producing subsidiary of United States Steel, on Aug. 1, 1946, having previously served for three years as president of another large U. S. Steel subsidiary, National Tube company.

Clifford F. Hood, president of American Steel and Wire company, Cleveland, United States Steel subsidiary, has been elected president of Carnegie-Illinois Steel, succeeding Mr. Cox.

He was borne near Monmouth, Ill., on Feb. 2, 1894. Mr. Hood attended public schools in Galesburg, Ill., and later majored in electrical engineering at the University of Illinois.

Following his graduation from college in 1915, Mr. Hood became associated with Packard Electric company of Warren, O. In 1917, he became an operating clerk in the Worcester, Mass., plant of American Steel & Wire company.

Resuming his career in 1919 after service in the first World War, he rose rapidly, advancing in 1932 to the post of assistant manager of the entire Worcester district operations.

On Jan. 1, 1933, he became manager of operations in the Worcester district and in 1935, he was transferred to Cleveland as vice president in charge of operations. Two years later, he was elected executive vice president, and on Jan. 1, 1938, president of the company.

Harry B. Jordan, vice-president in charge of operations of American Steel and Wire Company, in Cleveland, since 1939, has been elected president of the company, to succeed Mr. Hood.

Says Research Vital To Healthy Business

Failure to risk research investments for keeping products up to date or developing ones is the sign of a dying business, Edgar A. Jett, assistant director of Armour Research Foundation, told a business problems school meeting sponsored by the Chicago Association of Commerce and Industry at the Chicago Bar Association.

"In Illinois alone," he declared, "there are 14,000 persons engaged in research, and there are 25 commercial laboratories in Chicago with technical library facilities second to none."

Suggests Rental

Pointing out that industrial research can help maintain sales, reduce fabrication costs, and improve manufacturing levels, Jett said rental of facilities and hiring of specialized personnel to work out a specific project can be handled on a relatively modest budget.

He deplored the attitude on research as a "magic cure-all." Applied research ought to mean the job of making things better through science, he asserted.

WSE Women's Council News

"Designing Navy Tools and Torpedoes" was the topic of a talk by Mrs. Margaret Jones, a member of the Professional Women's Council of WSE at their meeting Wednesday, January 11.

* * *

The Women's Council was very fortunate in having Dr. Martha A. Ziegler as guest speaker at their December meeting. In her talk on legislation now in effect and pending which will affect the employment and working status of professional women, Dr. Ziegler stressed the importance of being alert to what is going on in the legislative field. She also stressed the necessity of knowing how to take positive action when such legislation will advance or hinder women in the professional fields, this also applies to the men in the profession.

* * *

A new year is here with a chance for the Professional Women's Council of WSE to become a full-fledged DIVISION. We have two more members since the last issue of MIDWEST ENGINEER came out, so let's get those new members!

Personal

Col. J. Monroe Johnson, interstate commerce commissioner, has been elected commission chairman for 1950.

Johnson succeeds Charles D. Mahaffie. He was in line for the post on two prior occasions but the late President Roosevelt appointed him director of defense transportation after Joseph Eastman died, and these duties took precedence over his ICC work.

He was assistant secretary of commerce from 1935 until 1940, when he joined the ICC.

An outspoken advocate of a department of transportation, Johnson has long contended the four main carrier media would fare better financially if governed by a single regulatory agency. He has urged President Truman on several occasions to sponsor legislation lumping 92 separate federal transport agencies into a single department.

WSE Representatives Attend Illinois Engineering Council Meeting in Peoria

Titus G. LeClair (WSE) and Donald N. Becker (WSE) attended the annual meeting of the Illinois Engineering Council at Peoria on December 10, 1949, as delegates of the Western Society of Engineers.

The Council is made up of representatives of 15 technical societies within the state of Illinois. Representation is roughly proportional to membership of the respective societies, with WSE having four representatives.

The purpose of the Council is to act for the good of the profession where joint action is considered desirable, as for example in the operation of the licensing laws.

At the meeting the officers and various committees reported on their activities during the year and officers for the ensuing year were elected. During the year a careful watch was kept on legislation introduced in the legislature and appropriate action taken to advance or protest it, as considered advisable. Recommendations were made from time to time to the Illinois Department of Registration and Education, covering the filling of vacancies on the Professional Engineers' Examining Board. The Council considered the vacancy created by the death in September of Isaac F. Stern (WSE) who was a member of the Examining Board. In this case three members of WSE have been suggested by the Council as replacements for Stern.

Obituary

Henry M. Brinckerhoff (M'96), died October 12 in Englewood, New Jersey, at the age of 81. He had been a Life Member of Western Society of Engineers since 1928.

He was a partner in the firm of Parsons, Brinckerhoff, Hogan and Macdonald and its predecessors.

In his early career as a transportation expert, he was General Manager of the Metropolitan Elevator Railroad in Chicago, and later was a member of the Chicago Subway Commission. He was connected with the construction of the I.R.T. subway in New York City, the Detroit-Windsor Tunnel, and the Chicago and Brooklyn elevated systems. He was consultant on construction of the New York World's Fair.

He held patents on the 3rd Rail System at the Chicago Columbian Exposition, and many other railway devices, and was author of numerous technical papers.

Belt Conveyors

To Transport People and Cargo Suggested by A. S. M. E. Speaker

A solution to New York's traffic congestion was offered by Harold Von Thaden, vice president of Hewitt-Robins, Inc., before the 70th Annual Meeting of the American Society of Mechanical Engineers in New York City, when he suggested mechanical belt conveyors below the city's streets to handle both people and cargo.

To handle cargo in this manner, Von Thaden said, would rid the city of at least 25% of the truck traffic that congests the mid-town area.

"The day of the widespread use of baggage conveyors is here at hand. At this moment, a major hotel chain is contemplating luggage conveyors running from street curb to hotel lobby.

"I would like to point out another excellent example of the need for a conveyor system. I refer to the subway train that shuttles weary, crowded passengers from Times Square to Grand Central Station. I believe that in our lifetime we will see that dirty, uncomfortable shuttle replaced by a moving sidewalk that will carry passengers quickly and safely between the two terminals. Furthermore, there's no reason why a connecting link could not add the Pennsylvania Station to the circuit," Von Thaden said.

"Along the same line would be a means to relieve the congestion of city traffic," he continued, "particularly heavy trucks jamming the streets, and turning sidewalks into unloading platforms. One remedy, which its backers claim will rid the streets of 25% of the large trucks, is to build large trucking depots at the edges of the central business district. Goods would still have to move from stores to terminals, however, but why not have them move on a public conveyor system? Suspended overhead or running underground, such a system could operate on a charge per tonnage basis, paid for by the users. With a freight conveyor like this there would be little need for trucks on our streets.

"The movement of both people and vehicles through the streets of our large cities is rapidly becoming a problem in materials handling. I believe the time has arrived when the civic development commissions of our great cities should have on their staffs a materials handling engineer, who can look at the handling of people as they move about a city as he looks at the handling of products as they are transported about a plant. His experience in the study of the flow of materials could solve many of our current traffic problems," he said.

"In short, one of the greatest bugaboos of modern transportation systems is the confusion that springs up at terminals when passengers, baggage and freight move on and off trains, trucks, ships, planes and busses. The even flow of people and materials has not kept pace with the advances made in speed and efficiency of transportation.

"With self-unloader ships, baggage conveyors, and ideas for moving sidewalks, a start has been made. But much more mechanization must take place before our arrival and departure confusion is resolved. Until this problem is solved, we have reached a point of diminishing returns in our transportation system at sea, rail, truck and air terminals.

"In recent years, there has been talk of the possible dwindling of the mighty Mesabi Range's supply of iron ore. Against that day, two other sources of supply have been investigated. In both plans the belt conveyor figures heavily. Should the utilization of low-grade taconite ore be developed, the only feasible means of handling the vast quantities of ore needed is the belt conveyor. Should ore supplies in Labrador, Morocco, and South America be developed further, again the belt conveyor would be indispensable, for in these countries present transportation systems are negligible," Mr. Von Thaden explained.

"In Labrador, for example, a belt conveyor system could feed ore to the projected railroad. It could carry certain materials over terrain where no railroad could operate. Conveying systems can make it possible to operate railroads profitably. The same situation applies in Africa and South America. The belt conveyor may well be the ultimate means for these relatively undeveloped areas to become the prosperous suppliers of raw materials to the world."

Concrete Institute to Meet

The tentative program for the 46th annual convention of the American Concrete Institute, to be held at the Edgewater Beach Hotel, February 20 to 22, has been announced by the Institute's technical activities committee. There will be seven sessions in five periods, with two of the periods being held concurrently.

As now set up, the program includes sessions on inspection, ACI Building Code studies, reinforced concrete design problems, structural design of concrete pavements, admixtures for concrete, a panel discussion of questions on concrete problems and the annual open session on concrete and cement research.

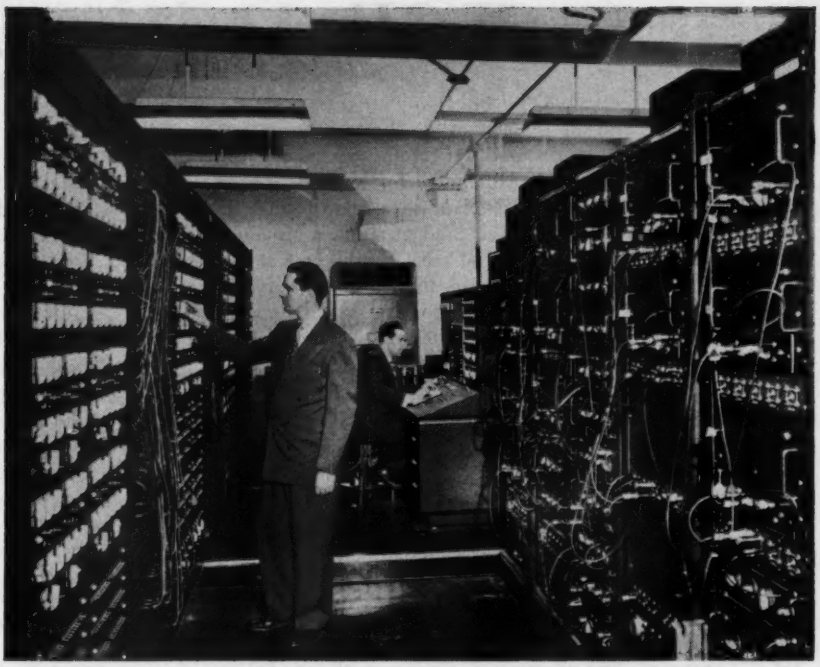
$250,000 Electric Computer Unveiled By N. U. Engineers

A quarter of a million dollar electronic computer that can save scientists years of research on a variety of problems, ranging from the design of automobile springs to intricate relations in the field of economics, has been unveiled at the Technological Institute of Northwestern University.

Part of the big machine was built by the Westinghouse Electric Corporation, which constructed the first computer of this type. Engineers of Northwestern's Aerial Measurements laboratory designed most of the electronic components, all of which were built by Northwestern students. The computer is financed and owned by the Bureau of Aeronautics, U. S. Navy. Two years were required to bring the machine into service, and it is continually being improved as new problems arise.

Here's how the computer operates. A mechanical, economic, or some other system is represented through a group of equations by a mathematician and then plugged into the computer. The equations and the system are thus set up in electrical form on the computer in what scientists call an analogue or analogy. Once the engineer has the system represented on the computer, he has only to turn dials to experiment with it. The results are observed in graphical form on an oscilloscope, which looks much like a television screen. Permanent record of what appears can be made by photographing the screen, and then the scientist retires to his desk to translate the findings back to the known values of the original problem.

The Northwestern engineers were quick to explain that the computer does no thinking on its own, that it merely provides tremendous shortcuts for the computing. Mathematicians still must juggle their equations in order to set them up on the computing machine, and afterwards there still remains the real task of interpreting the results. Nevertheless, they say that in many problems the machine greatly shortens work that otherwise would take months to years, if it were attempted at all.



Mathematical studies of ways to improve the "ridability features" of automobiles, busses, streetcars, and trains are examples of the kind of work where the computer can provide shortcuts. Once the system of equations has been represented on the machine, a few turns of the dials can provide the experimentation, at a saving of months or years of labor.

Occupying a room 22 by 55 feet, the big machine weighs more than ten tons. Twenty-five large cabinets, all of which can be interconnected to a main control desk, are needed to hold all the electronic devices which make up the computer. The room is air-conditioned so that the sensitive electronic elements will maintain the accuracy required during the solution of the problem.

WSE Applications

In accordance with the By-laws of the Western Society of Engineers, the following names of applicants are being submitted to the Admissions committee for examination as to their qualifications for admission to membership into the Society in the various grades, i.e., Student, Junior, Member, Associate, etc. All applicants must meet the highest standards of character and professionalism in order to qualify for admission, and each member of the Society should be alert to his responsibility to assist the Admissions committee in establishing that these standards are met. Any member of the Society, therefore, who has information relative to the qualifications or fitness of any of the applicants listed below, should inform the Secretary's office, 84 E. Randolph St., RA ndolph 6—1736.

229-81 Daniel J. Tallon, Owner, 624 S. Michigan Ave.
230-81 George W. Stierer; Manager, Structural Steel Dept., Robert W. Hunt Co., 175 W. Jackson Blvd.
231-81 Leonard P. Zick, Jr., Research Engineer, Chicago Bridge & Iron Co., 1305 W. 105th St.
232-81 Frank J. McKee, Sanitary Engineer, Kraft Foods Co., 500 Peshtigo Ct.
233-81 John S. Peterson, 3154 S. Michigan Ave., attending Illinois Institute of Technology.
234-81 Edward E. D. Potter, Technician 1st Grade, Commonwealth Edison Co., 72 W. Adams St.
235-81 Raymond J. Earsman, 10315 Avenue 'H', attending Illinois Institute of Technology.
236-81 Herman F. Noble, Secretary-Treasurer, Jamar-Olmen Co., 320 N. Harding Ave.
237-81 Nicholas A. Bilandic, 2840 S. Wells St., attending Illinois Institute of Technology.
238-81 Reynir Einarson, 3824 W. Fulton St., attending Illinois Institute of Technology.
239-81 Theo. B. Holden, General Supt., L. A. Marconi Co., Inc., 767 Milwaukee Ave.
240-81 Donald M. Abraham, 5854 N. Rockwell St., attending Illinois Institute of Technology.
241-81 Lynn E. Fussell, Trainee, Harbison-Walker Refining Co., 4343 Kennedy Ave., East Chicago, Ind.
242-81 Glenn F. Peterson, Supt., Holabird & Root & Burgee, 180 N. Wabash Av.
243-81 Jerre V. Manning, Manager, Chicago Office, Micro Switch (Freeport, Ill.), 308 W. Washington St.
244-81 Kurt W. Leibfritz, 3651 N. Oakley Ave., attending Illinois Institute of Technology.
245-81 Graydon W. Trout, Plant Separations Engineer, Illinois Bell Telephone Co., 208 W. Washington St.
246-81 John B. Johnson, Sales Engineer, Acorn Wire & Iron Works, 5912 Lowe Ave.
247-81 William K. Rust, Student Engineer, Illinois Bell Telephone Co., 6317 Maryland Ave.
248-81 Richard T. Gaffney, 6615 S. Racine Ave., attending Illinois Institute of Technology.
249-81 George E. Buchanan, Manager, Application Sect., Delta-Star Electric Co., 2400 Fulton St.
250-81 George J. Belbes (Rein.), Chief Engineer, Leader Electric Co., 3500 N. Kedzie Ave.
251-81 Max Rosenberg, Electrical & Planning Engineer, Leader Electric Co., 3500 N. Kedzie Ave.
252-81 Max C. Alvarez, IV, 5230 S. Monitor Ave., attending Illinois Institute of Technology.
253-81 John T. Dygdon, 2050 W. Cullerton St., attending Illinois Institute of Technology.
254-81 Walter M. Dygdon, 2050 W. Cullerton St., attending Illinois Institute of Technology.
255-81 Lee T. Chandler, Division Engineer, Edwards Co., 600 W. Jackson Blvd.
256-81 Joan M. O'Brien, Engineering Clerk, Illinois Bell Telephone Co., 212 W. Washington St.
257-81 Inar C. Hillman, Professional Engineer, 343 S. Dearborn St.
258-81 James W. Anderson, Engineer-Draftsman, Chicago, Burlington & Quincy Railroad Co., 547 W. Jackson Blvd.
259-81 Lois Graham, Instructor, Illinois Institute of Technology, 3300 S. Federal St.
260-81 Charles Waldmann, Member of Board of Dir., Ch. Engr. & Pres. of Park Forest Water Co. (American Community Builders, Inc.), Park Forest, Chicago Heights, Ill.
261-81 Herbert W. Kelly, General Manager, U. S. Challenge Co., 800-38 S. Dearborn St.
262-81 Reynolds E. Smith, Division Engineer, Public Service Company of Northern Illinois, 22 W. Cass St., Joliet, Ill.
263-81 Earl G. Beard, Principal Assist. Sub. Engr., Department of Subways & Superhighways, 20 N. Wacker Dr.
264-81 Roderick L. Velde, Jr., Sales Representative, Coca-Cola Company, Fountain Division, 1032 S. Pulaski Rd.
265-81 Noel G. Artman, Patent Lawyer, International Harvester Co., 180 N. Michigan Ave.
266-81 Richard W. Swain, Draftsman, Joseph Goder Incinerators, 5121 N. Ravenswood Ave.

Automobile and Allied Industries End Top Production Year

Measured in almost any terms, 1949 was a banner year for highway transportation. It looks like 1950 may be an even better one in some respects, according to the National Highway Users Conference.

The nation's greatest and smallest industries find their common meeting ground in highway transportation. While statistics on 1949 are not yet available for some of these industries, one big one stands out. The automobile industry produced more units than ever before in history, surpassing even 1929. The production and sales accomplishments of this and allied industries made one out of every seven jobs in the nation.

The petroleum industry produced more motor fuel than ever before to propel America's 44 million vehicles. These 44 million passenger cars, busses and trucks themselves set a record in their numbers, as registrations were 44 per cent greater than at the end of 1945.

The rubber industry also found it a heavy production year, even though replacement demand was not as heavy as in 1947 and 1948. Tires for new cars set a record. Overall, it was the tire manufacturers' third biggest year.

Road building to meet the traffic generated by the record vehicle registration also has been in high gear, according to N.H.U.C. Actual physical construction volume on roads which receive Federal aid was highest in history in 1949 with state and local expenditures keeping pace. Total Federal, state and local spending on roads, including maintenance, is estimated to have cost $3 billion in 1949.

Money for this job came largely from the motor vehicle use taxes, although the user is not the only beneficiary of the improvements. Even where the highway user's tax rates were not raised, he was contributing greatly more in taxes simply because he was using more gasoline and registering more cars. However, 16 state legislatures voted to increase gasoline taxes and increases were proposed but defeated in another 17. Some of the proposed increases would not have been earmarked for highway purposes.

Radio Device Finds Power Line Faults

An automatic radio sleuth which tracks down trouble on high voltage power lines in seconds, was described for the American Institute of Electrical Engineers at their Winter Meeting.

The new trouble shooting system, employing pulse time modulation radio relays, prints at a terminal station the time, and the location within 600 feet, of high voltage faults that occur anywhere on the line, according to Robert W. Hughes and Nelson Weintraub, Federal Telecommunication Laboratories engineers. They explained that repair crews now can be dispatched immediately to the scene, instead of taking hours to locate the trouble.

Reviews of Technical Books

Personnel Relations

Men At Work, by C. A. Oakey, Houghton and Stoughton, Ltd., London, 1946. 301 pp. $2.25.

This volume covers industrial psychology in the factory in non-technical language. Although written on the basis of development and research made in British industry, a corresponding treatise based on American industry would be similar. Numerous citations are made from American sources.

The author organizes his discussion under these topics: (1) managers and managed, (2) choosing young workpeople, (3) training for work, (4) tiredness, (5) the physical background to work, (6) avoiding accidents, and (7) effective work in place of hard work. These topics are supplemented by an introduction on the general field of industrial psychology and a concluding summarizing presentation under the caption, "The Human Factor in Industry."

The subject matter under each topic is largely descriptive, the principles being presented only as observations or comments. This plan yields a book which is easy to follow and understand. It treats industrial psychology chiefly from the viewpoint of human beings in industrial activities.

L.R.D., WSE.

Biochemistry

Textbook of Biochemistry, by Phillip H. Mitchell, McGraw-Hill Book Co., New York City, 1946. 640 pp. $6.00.

Although this textbook is designed for a first course in biochemistry, it presupposes courses in organic and physical chemistry. A course in advanced physiology would also be helpful in understanding some of the subject matter included. The essentials of biochemistry, centered upon metabolism and human nutrition, are presented in a modernized treatment but at the same time the older established biochemical knowledge has been well-covered.

The recent advances made possible by the use of isotopes as tracers, of surviving tissue slices, and of other modern methods, are given special attention. The newer work on the chemistry of the vitamins, enzymes, and hormones is also presented. Chemotherapeutic agents or chemical substances which are specifically more injurious to invading microorganisms than they are to the tissues of the animal body are discussed in the last chapter.

This text is a well-organized treatise on biochemistry, an intricate subject dealing with the chemistry of living matter, and a subject attempting to decipher the chemical structure of molecules that are among the largest and the most complex in nature. Extensive bibliographic references are given and coincident study of these original documents with the summaries presented will serve to give a clearer view of the condensations presented in the text.

L.R.D., WSE.

Power Transmission

Electric Power Transmission, by M. P. Weinbach, The Macmillan Company, New York City, 1948. 362 pp. $5.50.

This book is the outgrowth of many years of teaching transmission courses at the University of Missouri. It is concerned with the problems arising on long transmission lines.

The increasing length of transmission lines and the complexity of the circuits requie more and more analysis of the systems. Such studies require the careful approach as treated in this book.

Practical problems are solved in the course of the explanations. The subject matter necessitates the use of considerable mathematics, which is presented in a clear manner. The book is well indexed, facilitating its use as a reference book.

J.A.S., WSE.

Soaps

The Alkaline-Earth and Heavy-Metal Soaps, by Stanley B. Elliott, Reinhold Publishing Corporation, 330 West Forty-second Street, New York City, 1946. 346 pp. $7.50.

This is one of the monograph series of the American Chemical Society and is intended to acquaint the research chemists and technologists in a number of industries with the manufacture, properties and typical applications of the alkaline-earth and heavy-metal soaps. Numerous discussions have appeared in the journals, but this book collectively treats the subject at length. These compounds have broad commercial applications in forms such as lubricating greases, paint ingredients, water-proofing materials, fungicides, pharmaceutical lines, cosmetics and many others.

Chapters pertain to the constitution of metallic soaps, organic raw materials, inorganic raw materials, solvents and addition agents, precipitated and fused soap, plant and equipment, classification and application. Eight chapters present soaps with respect to groups of metals entering into their composition and a following chapter discusses analysis. The several appendixes cover patents, specifications, applications, conversion tables, common commercial metallic salts, and inorganic compounds suitable for preparing metallic soap.

E.B., WSE.

Marine Engineering

Marine Engineers' Handbook, Ed. by J. M. Labberton, McGraw-Hill Book Co., New York City, 1945. 2013 pp. $7.50.

This book contains a wealth of information, each section being written by a recognized authority in his line.

Although intended primarily for the marine designer, it should prove invaluable to the sea-going engineer with its 1950 pages of theoretical and practical data on hulls, propulsion, and auxiliaries.

L.R.D., WSE.

Geometry

Technical Descriptive Geometry, by B. Leighton Wellman. McGraw-Hill Book Co. Inc., 1948. 508 pp. $4.00.

Here is a new treatment of descriptive geometry that will appeal to those who have trouble with the method of projections upon imaginary planes, and revolution of these planes about reference lines. The author classifies all auxiliary views simply as "adjacent" or "related," and attention is concentrated on the direction of sight for these views.

The book is written to provide students and industrial draftsmen with an up-to-date treatment of the subject. It has simple language, and is generously illustrated. It carries the student by easy stages to the complex intersection and development problems found in modern applications, which include double-curved surfaces, such as met in ship, automobile and aircraft construction.

At the end of the book are 140 pages of problems, which give the student a thorough test of his mastery of the subject.

H.F.W., WSE.

Astronomy

Practical Astronomy, Second Edition, by Jason John Nassau, McGraw-Hill Book Co. Inc., 1948. 311 pp. $5.00.

This well-written book is divided into two parts. Part I, designed for a first course in practical astronomy, deals with fundamental principles, and ordinary determinations of time, latitude and longitude, and azimuth.

The instruments used in making observations are described, together with their use and adjustment. The proper methods of recording observations, and making the computations are illustrated with examples, and blank forms are given at the end of the book.

Part II presents all the advanced material necessary for field work in geodetic astronomy. It describes basic methods for precise determination of time, latitude and longitude, and azimuth, with proofs of all the necessary formulae.

A new feature is the description of the modern astrolabe as an instrument for the determination of the geographic position of the observer. Tables from the American Nautical Almanac and American Ephemeris, and from the U. S. Naval Observatory, answers to problems, and star maps are given in the appendix.

H.F.W., WSE.

Frequency Modulation Servicing

F-M Simplified, by Milton S. Kiver, D. Van Nostrand Company, Inc., New York City, 1947. 347 pp. $6.00.

The purpose of this book is to bridge the gap between the amplitude-modulation techniques and the frequency-modulation characteristics. It should be of particular value to the service man who goes beyond the usual requirements of radio repair. Repair and maintenance of F-M equipment require a higher level of technical knowledge than was formerly necessary.

The section on commercial receivers carries quite a few diagrams of such receivers, illustrating variations in circuit design. Servicing of these receivers is given detailed treatment.

J.A.S., WSE.

Emulsions

Introduction to Emulsions, by George M. Sutheim, Chemical Publishing Co., Inc., Brooklyn, N. Y., 1946. 260 pp. $4.75.

While the public may not recognize them as such, nevertheless it is constantly using emulsions in quantity and in varied forms. Milk and rubber latex are natural emulsions and a high percentage of synthetic rubbers are made by emulsion polymerization. Coatings are represented by asphalt and bituminous emulsions, emulsion paint, waterproofing and fireproofing materials; other sizable items are insecticidal sprays, numerous foods, cosmetics, pharmaceutical preparations, cleansing fluids and polishes. The reverse is illustrated by the demulsification of some 400 million barrels of oil per year.

Emulsions are intimate mixtures of two liquids which naturally oppose submitting to such action. It is accomplished by skillful processing under favorable conditions as to temperature and other requisites, together with the addition of a third substance or emulsifying agent and violent mechanical agitation. The formation of an emulsion consists of two equally important parts: the preparation of suitable conditions, which is a physico-chemical problem, and the work of emulsion which is an engineering problem.

This book is a comprehensive manual devoted to the fundamentals of emulsions.

E.B., WSE.

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DESIGN-DEVELOPMENT, M.E., background, 39, nine years exp. Ch. Engr., asst. product designer, design-development, experimental development on meters (full charge of all engrg. & mfg. methods—200 employees) job shop (valves, farm mchy., package mchy.) coin machines (fare box, sorters, counters, packagers, dispensaries) photo lenses and electronics. $5000 up. Chicago. 112-W.

TOOL ENGINEER, M.E. background, 40, ten yrs.' exp. Ch. Tool Engr. (gas & elec. motors) Supr. Tooling and production (electronic) master mechanic (gas motors, tooling, tool making, tool procurement, production methods, plant layout etc. Ch. Methods Engr. (instruments, assembly, machining, tooling, layout standards,) Ch. Inspector (aircraft-quality control, tool engineering). Desires production engineering. $6500. Midwest. 113-W.

DEVELOPMENT-PRODUCTION (communications, electronics) grad. E.E., 36, fifteen yrs.' exp. design (telephone circuiting, installation specs. equipment) test, install, maintain and operate (carrier equipment, h.f. relay stations) manage central service division (electronics) providing technical assistance to national organization and engineering reports for design-development-production divisions. $5000. Chicago. 114-W.

DRAFT-DESIGN, grad. M.E., 27, six yrs.' exp. outside telephone plant construction and maintenance, cost estimates, plans, labor assignment, construction design, also aircraft shop supervision. $3600. Midwest. 115-W.

DRAFTSMAN, M.E. 42, experienced as engineering draftsman (buildings and mechanical equipment) senior draftsman (motor coaches) intermediate draftsman (pressure vessels and storage tanks) detail draftsman (conveyors-stokers-aircraft). $4000. Any U. S. 116-W.

MANAGER OR SUPT. (steel) grad. Met. Eng. and Genl. Engr., 40, over 15 yrs.' open hearth exp., supt. mech. engr., production, standards, treatment. $8000 plus. Western U. S. 117-W.

DEVELOPMENT OR SALES ENGINEER, 28, eight years' progressive exp. electronics and precision mechanical development. 1 yr. project supervisor, 2 yrs. own business, some sales experience. Familiar with large variety of technical equipment and experimental work. Salary open. Chicago. 106-W.

CIVIL ENGINEER, grad., 23, one-half yr. exp. state highway construction; inspection of reinforced concrete structures and pavement widening. Acted as party chief, made highway surveys, worked in highway lab. Desires work with consulting engineer or established contractor in Chicago. 107-W.

MANAGEMENT ENGINEER, grad. M.E. 50, over twenty yrs.' exp., budgetary control, time study, wage incentives, job evaluation, plant layout, production control and labor negotiations in manufacture; general machine shops (jobbing and production), chemicals, wood flooring, boxes and furniture. $7200. Chicago or Midwest. 108-W.

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Positions Available

Include postage to cover forwarding and return of application. If placed in a position as a result of an Engineers Available or Position Available advertisement, applicants agree to pay the established placement fee. These rates are available on request and are sufficient to maintain an effective non-profit personnel service. Prepared ENGINEERS AVAILABLE advertisements limited to 75 words, with typed resume attached may be submitted to ESPS Chicago by members of Western Society of Engineers at no charge. A weekly bulletin of positions open is available to subscribers. Apply ESPS Chicago.

6127 STRUCTURAL ENG. Ill. lic. exper. industrial-type bldgs. Prefer previous govt. clearance. Sal. open. Chicago.

6129 DESIGN-DRAFT (elec. control) E.E. exper. industrial elec. control applications for printing press. Sal. open. Chicago.

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6123 DEVELOP. & DESIGN ENG., M.E. or equiv. 8-10 years exp. flat steel strapping equip., knowledge of devices, shop equip., tooling, and mfg. and able to handle and direct design, development and provide analytical reasoning. $5000 up. Chicago.

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6131(a) DRAFTSMAN (elec.) several years exp. or 1 yr. plus college, draft elec. power, control and lighting plans. $250-400. Chicago.

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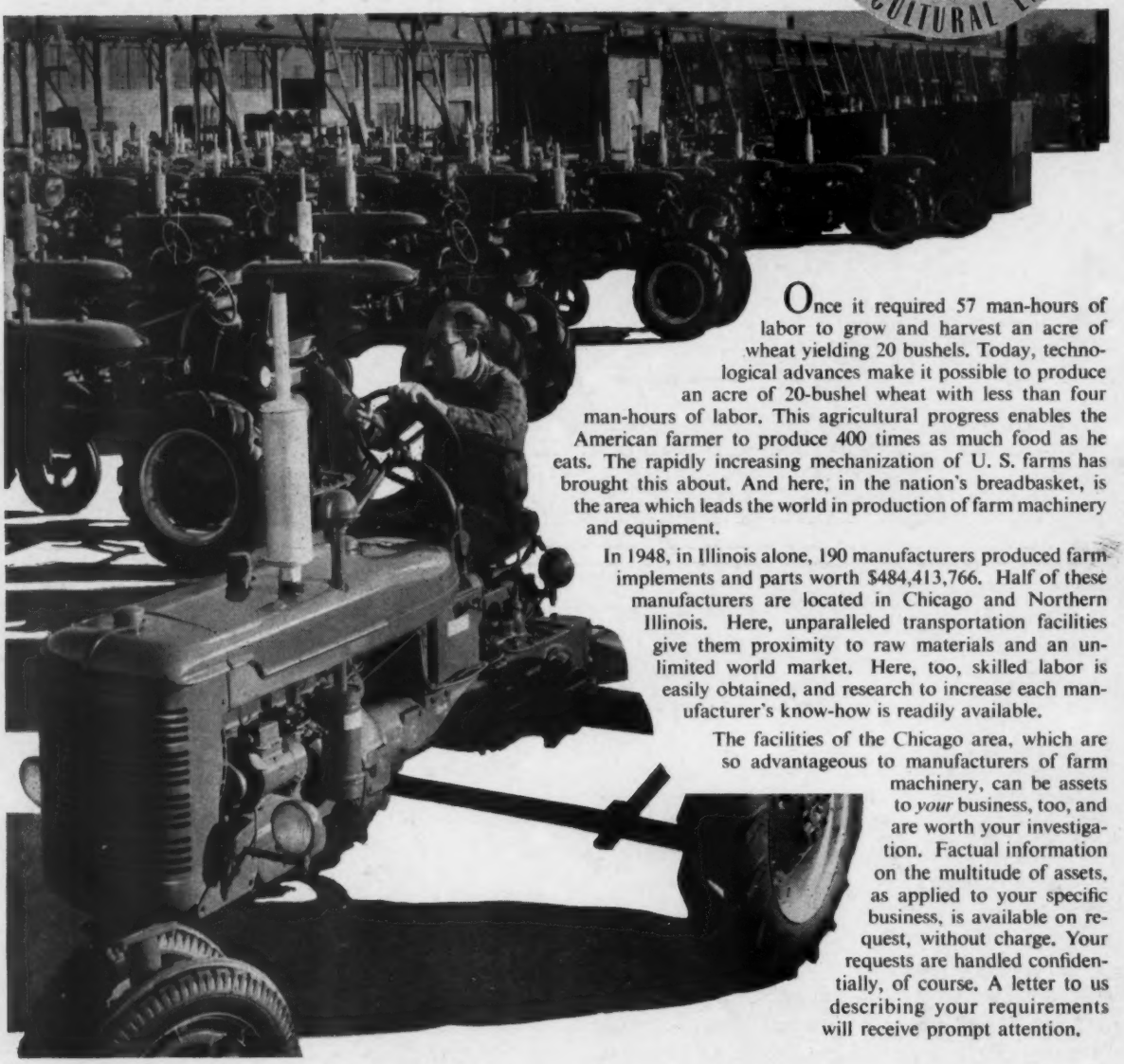

Once it required 57 man-hours of labor to grow and harvest an acre of wheat yielding 20 bushels. Today, technological advances make it possible to produce an acre of 20-bushel wheat with less than four man-hours of labor. This agricultural progress enables the American farmer to produce 400 times as much food as he eats. The rapidly increasing mechanization of U. S. farms has brought this about. And here, in the nation's breadbasket, is the area which leads the world in production of farm machinery and equipment.

In 1948, in Illinois alone, 190 manufacturers produced farm implements and parts worth $484,413,766. Half of these manufacturers are located in Chicago and Northern Illinois. Here, unparalleled transportation facilities give them proximity to raw materials and an unlimited world market. Here, too, skilled labor is easily obtained, and research to increase each manufacturer's know-how is readily available.

The facilities of the Chicago area, which are so advantageous to manufacturers of farm machinery, can be assets to *your* business, too, and are worth your investigation. Factual information on the multitude of assets, as applied to your specific business, is available on request, without charge. Your requests are handled confidentially, of course. A letter to us describing your requirements will receive prompt attention.

Industries in the Chicago area have these outstanding advantages: *Railroad Center of the United States • World Airport • Inland Waterways • Geographical Center of U. S. Population • Great Financial Center • The "Great Central Market" Food Producing and Processing Center • Leader in Iron and Steel Manufacturing • Good Labor Relations Record • 2,500,000 Kilowatts of Power • Tremendous Coal Reserves • Good Government • Good Living • Good Services for Tax Dollars.*

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Jan 1950 Midwest engineer V. 2 #5
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Yearbook Supplement

WESTERN SOCIETY OF ENGINEERS
84 EAST RANDOLPH STREET CHICAGO 1, ILLINOIS

MIDWEST ENGINEER — JANUARY, 1950 — VOL. 2, NO. 5
IN TWO PARTS — PART TWO


THE WESTERN SOCIETY OF ENGINEERS
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INCORPORATED 1880
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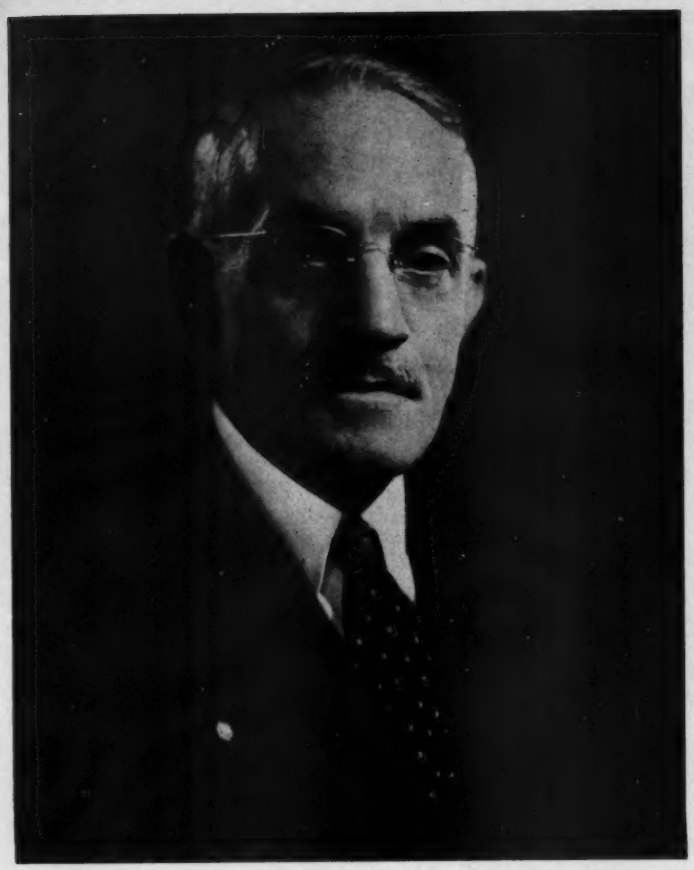

GUSTAV EGLOFF,

President

Dr. Gustav Egloff has been Petroleum Technologist for Universal Oil Products Company since 1944, and was Director of Research for the same firm from 1917 to 1944. In 1916 he was associated with the Aetna Chemical Co., Pittsburgh, and in 1915 with the U. S. Bureau of Mines. He was graduated from Cornell University in 1912, receiving an A.B. degree. He received an M.A. degree from Columbia University in 1913, and a Ph.D. degree from Columbia in 1916. During the period 1914-15 he was a Barnard Research Fellow at Columbia, and also served as Assistant to the Curator, Chandler Museum, Columbia University.

Dr. Egloff joined The Western Society of Engineers in 1936 and was a director of the Chemical and Metallurgical Engineering section 1936-39, serving as chairman from 1937 to 1939. His committee service has included the Library, Program, Cooperative Relations, Attendance, and Development Committees. He was elected a Trustee in 1944, and was First Vice President for the year 1948-49.

H. P. SEDWICK,

First Vice President

Mr. Sedwick joined The Western Society of Engineers in 1923. He served as a member of the Executive Committee of the Gas Fuels and Combustion Engineering Section from 1945 to 1948 and was Chairman of the Management Committee, 1946-47. He was Chairman of the Development Committee for the year 1947-48; Co-Chairman of this Committee for the year 1948-49; a Trustee of the Society, 1945-47; and Second Vice President for the year 1948-49. Mr. Sedwick has been associated with Public Service Company of Northern Illinois since 1913 where he had served in various engineering and operating capacities until 1941 when he became a Vice President of that company.

J. C. WITT,

Second Vice President

J. C. Witt studied first for a Ph.D. degree in chemistry and physics at the University of Pittsburgh, and later added the M.E. degree at Armour Institute of Technology.

Most of his professional experience has concerned the manufacture and use of Portland cement. He was Technical Director of the Rizal Cement Company in the Philippines, later Director of Research for Universal Atlas Cement Company, and then Technical Director for Marquette Cement Manufacturing Company for ten years. He is now a consulting engineer.

Becoming a member of WSE in 1936, he served as Director of the Chemical and Metallurgical Engineering Section for five years (Chairman, two years), and has served on the following committees: Program (Chairman), Awards, Civic, Publications, Admissions, Fellowship.

He is a member of numerous technical organizations, and is the author of "Portland Cement Technology."

DONALD N. BECKER,

Treasurer

Donald N. Becker has been Chief Structural Engineer with A. J. Boynton and Company since March, 1948, and previously was Engineer of Bridge Design for the City of Chicago for 24 years. He was graduated from Rensselaer Polytechnic Institute in 1908 with the degree of Civil Engineer.

Mr. Becker joined WSE as a member in 1920 and has served as a Director of the Bridge and Structural Engineering section for six years, including one year as chairman. He has been Chairman of the Attendance and Admissions committees, and has served on the Library, Fellowship, and Civic committees.

He was a Trustee of the Society from 1944 to 1946. In November, 1948, he was elected to fill the unexpired term of Milton P. Vore, who died October 19, 1948, and was re-elected Treasurer in May, 1949.

He has written numerous technical papers on bridge subjects, including one which was awarded the Thomas Fitch Rowland prize by the ASCE in 1946.

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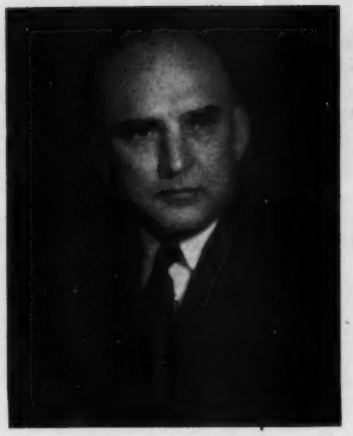

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Schuler, R. G.
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Schweitzer, William E.
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MEMBERSHIP LIST

CHANGES AND ADDITIONS

Only changes and additions are included in this supplement to the 1948-49 Yearbook. The next complete Yearbook will be published in September, 1950.

After each name is an abbreviation showing the grade of membership and the year in which the member accepted that grade. In these abbreviations Hon. M, is for honorary member; M, member; A, associate; J, junior; S, student; and Aff, affiliate.

City and state have been omitted for all Chicago addresses.

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Wicklatz, Edward G. (M'49), Chief, Engr., (Alemite Div.), Stewart-Warner Corp., 1826 Diversey Ave.

Wiegman, Harold H. (S'49), Tool Engr., U. S. Naval Ordnance Plant, 7500 W. Roosevelt Rd., Forest Park, Ill.

Wiese, Ralph A. (A'46), Struc. Designer, Division of Bldg. & Safety, County of Kern, 1101 Golden State Highway, Bakersfield, Calif.

Wiese, Robert C. (S'49), Asst. Chem Engr., Zarco Industries, 3115 W. 36th St.

Wilson, Francis E. (M'49), Engr., Illinois Bell Telephone Co., 208 W. Washington St., 1.

Winslow, John E. (Aff'49), Gen. Superv., Oxweld Railway Service Co., 230 N. Michigan Ave., 1.

Winter, Geo. R. (M'45), Vice Pres., Hansell Elcock Co., 485 W. 23rd St., 16.

WITT, J. C. (M'36) (Second Vice-President), Cons. Engr., 5834 Stony Island Ave., 37.

Wolff, Bruno B. (M'43), Chief Engr., Chicago Tramrail Corp., 4000 W. Washington Blvd.

Wulff, Alden Thayer (J'49), Asst. Engr., Public Service Company of Northern Illinois, 3301-59 Oakton St., Sta. #28, Skokie, Ill.

Wyly, L. T. (A'28; M'35), Purdue University, West Lafayette, Ind.

Y

Young, Leo N. (M'48), Engr., Struc. Des., Commonwealth Edison Company, 72 W. Adams St., 90.

Young, Roy C. (M'49), Sales Engr., O. M. Bercaw & R. C. Young, 333 N. Michigan Ave., 1.

Z

Zack, Hans J. (M'36), Pres., The Mack Company, 4606-28 W. 12th Pl., 50.

Zaretsky, Mitchell (S'49), Prod. Mgr., Alba Art Studios, 1916 S. Trumbull St., 23.

Zditosky, Harry (S'49), 10148 Vernon Ave., 28.

Ziebold, Eugene H. (M'47), Asst. to Vice Pres., Solar Aircraft Company, 2200 Pacific Highway, San Diego 12, Calif.

Ziesing, Henry H. (J'10; M'23), Vice Pres., The Midvale Company, Philadelphia 40, Pennsylvania.

Life Members

Life Memberships were awarded to the following men in June, 1949:

Armstrong, H. G.
Arn, W. G.
Barber, J. D.
Bassett, James J.
Beebe, Horace M.
Bird, Byron
Brooks, Charles C.
Brumley, Daniel J.
Brussel, Hugues
Clark, Albert B.
Colvin, Albert A.
Cook, Robert A.
Cosley, Harvey H.
Cramer, Frank H.
D'Esposito, Joshua
Emmert, Roy W.
Enander, E. H.
Engh, Harry M.
Epstein, A.
Fry, August J.
Greeley, Samuel A.
Grover, Earle W.
Havens, George
Hempelmann, Walter L.
Herz, Alfred
Jeffries, Wm. R.
Johnson, John
Johnson, Maro
Jordan, T. A.
Juhnke, Paul B.
Karp, Elmer H.
King, P. W.
Knight, Robert
Lehle, Geo. L.
Llewellyn, R. C.
Loweth, F. C.
Luce, Arthur T.
Lurie, Erwin M.
MacDowell, Charles H.
Macomb, J. de N.
Massey, George B.
Mathews, William W.
Maxwell, Donald H.
Niemann, F. A.
Nusz, W. G.
Park, Wm. M.
PenDell, Charles W.
Poor, Fred A.
Post, Chester L.
Quinlan, George A.
Ramey, Horace P.
Reynolds, I. L.
Richards, Norman J.
Ripley, Herbert S.
Riley, Maynard H.
Rossman, A. M.
Schweitzer, Edmund O. (deceased)
Steffa, Homer I.
Trinkaus, William H.
Weber, Emil A.
Westburg, Paul A.
Young, Hugh E.

Deceased

The following members have died since January 1, 1949:

Anderson, Emil N.
Bain, A. J.
Bee, Albert W. Jr.
Brinckerhoff, Henry M.
Brown, Joseph H.
Christy, Andrew
Crocker, Herbert S.
Dose, H. F.
Evans, William G.
Graf, Robert J.
Hall, Charles F.
Harrington, Philip
Huffman, Frank C.
Hupp, Vernon E.
Mason, A. Waller
Rice, Ivan S.
Rogers, Fred A.
Schweitzer, Edmund O.
Shuma, William F.
Stern, I. F.
Thomas, M. E.
White, Linn
Wolhaupter, Benjamin

Fabricators and Erectors of *Structural Steel*

• Statistics show the steel industry has facilities to fabricate and erect over two million tons of steel in 1949. America finds Allied ready with *three* fully equipped plants, operating under unified control, with abundant capacity to tackle a big share of the job. Here expert crews fabricate and erect bridges and buildings from the blueprint stage to finished structures. We invite you to consult Allied on any structural job that's pending . . . large or small. Send us your specifications for estimates.

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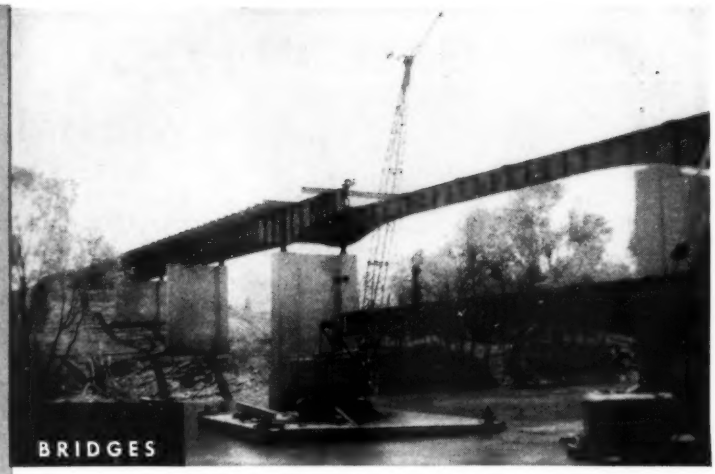

Allied engineers adapt methods to the job, often employing water erection with floating equipment to shorten bridge-building hours.

Similar equipment in each of Allied's three plants speeded up fabrication of structurals for this giant industrial plant.

3250 Tons of steel were fabricated by Allied for this California highway bridge . . . erected according to Allied's precision method.